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→ Manhattan, † Kansas. ←

EDITED BY

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PROFESSOR IN THE KANSAS STATE AGRICULTURAL COLLEGE, MANHATTAN, KANSAS.

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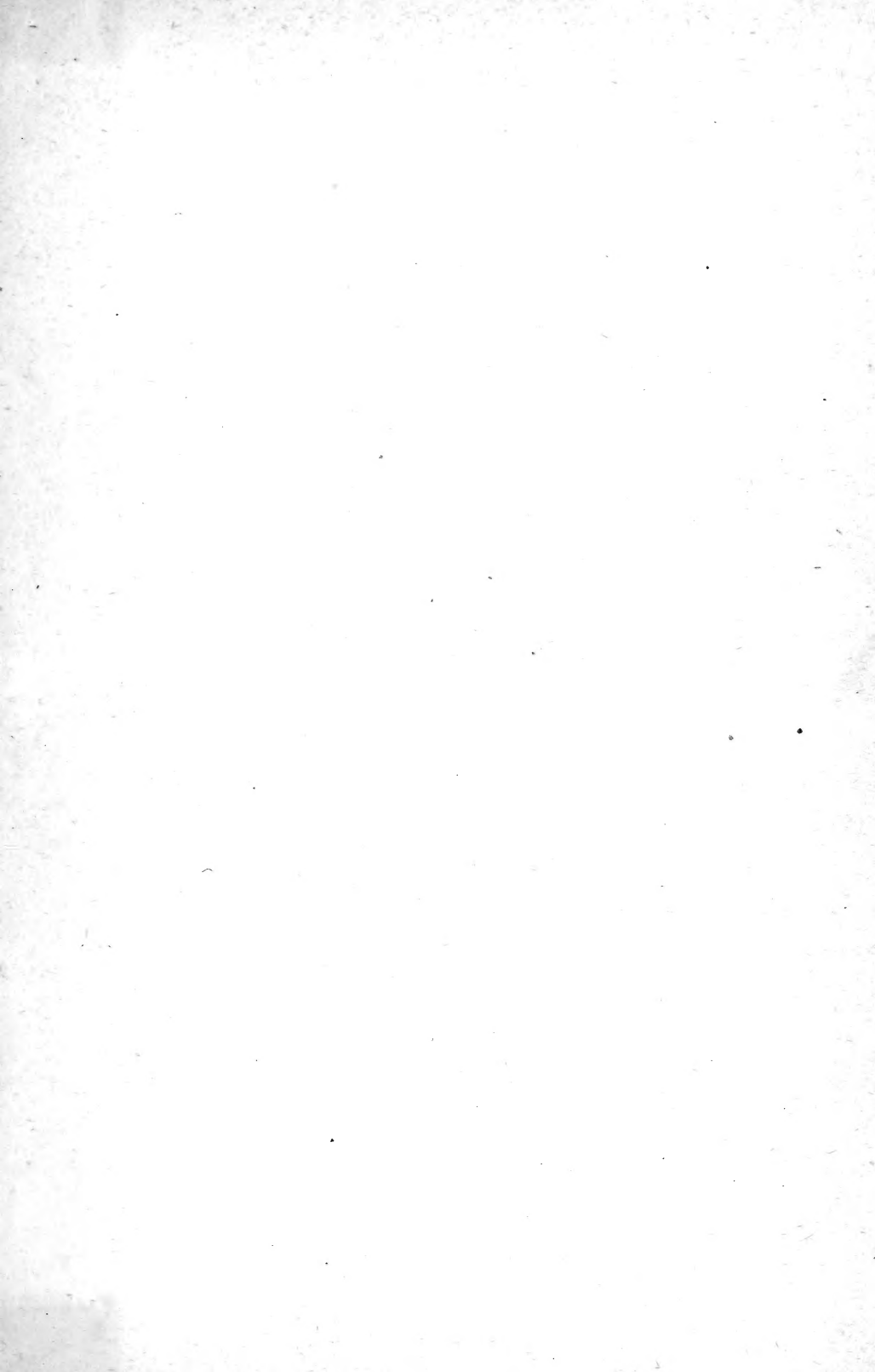
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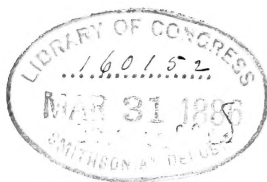
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—AND—

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JOURNAL OF MYCOLOGY.

Vol. I.

MANHATTAN, KANSAS, JANUARY, 1885.

No. 1.

SALUTATORY.

The increasing interest in the study of Mycology in this country, during the past few years, has made more apparent than ever, the need of collecting into one publication all the literature pertaining to the subject. This, if accomplished, would be a source of great convenience as well as economy, both to the specialist and to the amateur in this department of botany. The JOURNAL OF MYCOLOGY proposes to meet this want and supply this need, in so far as a carefully edited monthly publication may be able to do so. With this end in view, a medium will here be offered for the publication of *new species* of Fungi as they may appear from time to time. While this will be a leading feature of the JOURNAL, it will by no means occupy all of its pages. It is proposed to give, from time to time, Monographs of the different genera of Fungi prepared by those who have given special attention to the study of each particular family, and to this end a cordial invitation is extended to all who are interested in improving our knowledge of North American Mycology. As an initial effort in this direction, an Enumeration of the North American Cercosporæ, with descriptions of the species,* will begin in the next number. This plan, if successfully carried out, will result, practically, in a Manual of our Fungi—a desideratum of special importance. Besides this, on account of all the current literature on mycological subjects will be regularly given. Neither will popular scientific articles relating to species of Fungi, nor reviews or criticisms of important publications, nor any other mycological matter of interest, by eminent writers, be excluded. In the hope of successfully carrying out the above scheme, we hereby invite the co-operation of all who are interested in mycological botany.

* The paper on Geasters was not received till after this was in print.

NEW KANSAS FUNGI.*

BY J. B. ELLIS AND W. A. KELLERMAN.

PERONOSPORA OXYBAPHI, E. & K.—On *O. nyctagineus*. Manhattan, Ks., June, 1884. Conidiophores simple below, about 3 times dichotomously branched above, the ultimate divisions stout and slightly curved; conidia elliptical, pale violet-brown, $20-26 \times 12-15\mu$. Oospores $35-40\mu$, rusty brown, epispore rough.

PUCCINIA LITHOSPERMI, E. & K.—On *Lithospermum canescens*, Manhattan, Ks. *Aecidium* and *uredo* not seen. Teleutospores—sori amphigenous, round, black, soon naked, scattered, small, ($\frac{1}{2}$ mm.) spores elongated, mostly attenuated above, strongly constricted, of a deep reddish brown above, paler below, $32-45 \times 20-23\mu$, epispore smooth, thickened above so as to form an obtuse point which is often oblique but sometimes the apex is regularly rounded, pedicels rather stout, as long as or longer than the spore.

CERCOSPORA CONDENSATA, E. & K.—On leaves of *Gleditsia triacanthos*. Manhattan, Ks., July, '84. On small (1—2 mm.) brown or dirty white round spots with an obscure dark border. Hyphae mostly epiphyllous, brown, (continuous)? obtuse, subdenticulate above, $30-80 \times 4-5\mu$, densely compacted so as to form little black tubercles much resembling perithecia; conidia slender or concave-cylindrical, nucleate and pale brown, becoming 6—9 septate, $60-75 \times 4\mu$.—var. *Desmanthi* (on *D. brachylobus*, Great Bend, Ks.) differs in its shorter hyphae and shorter ($30-35\mu$) 1-septate conidia and in the absence of any very definite spots, differences which are probably due to immaturity.

CERCOSPORA FRAXINI, E. & K.—On living leaves of *Fraxinus*, Manhattan, Ks., Sept. '84. Scattered over the lower surface of the leaf on small, rusty brown spots, limited by the veinlets of the leaf and forming at length, by confluence, much larger ($\frac{1}{2}$ —1 cm.) patches with an irregular outline. The leaf is also mottled above with rusty brown in which small, light colored spots mark the position of the denser tufts beneath. Hyphae densely tufted, nearly hyaline, short, ($16-25\mu$) lax, slightly swollen at the base, bearing the cylindrical, nearly hyaline (with a slight yellowish tinge) 3—4 septate, granular and nucleate conidia $70,-100 \times 5-6\mu$ more or less curved and ends obtuse. Accompanied by an immature *Sphaerella* of which it is probably the conidial stage. This species varies considerably from the usual type of *Corcospora* standing rather equivocally between this genus and *Ramularie*.

CERCOSPORA DIANTHERÆ, E. & K.—On *Dianthera Americana*. Topeka, Ks., (Popenoe.) Sept. 1884. On round white spots, 2—4 mm. in

* Collected by W. A. Kellerman during the season of 1884.

diameter, mostly included in brown dead areas of the leaf which are limited by a dark, narrow border. Hyphæ in small, loose spreading tufts, mostly 3—10 in each tuft, brown, continuous or sparingly and faintly septate, more or less geniculate and toothed above, $50-75 \times 4\frac{1}{2}-5\mu$, conidia slender, linear-lanceolate, $50-80 \times 4-5\mu$, multiseptate, hyaline. Quite different from *C. consociata* Winter.

CERCOSPORA GLANDULOSA, E. & K.—On leaves of *Ailanthus glandulosa*, Manhattan, Ks., March '84. Hypophyllous on reddish brown spots ($\frac{1}{2}$ — $\frac{1}{4}$ cm.) limited above by a slightly raised border; hyphæ cæspitose, brown, stout, subundulate above, $50-70 \times 4-5\mu$; conidia hyaline slender, 3—5 septate, $70-100 \times 3-3\frac{1}{2}\mu$, gradually narrowed above. The spots become at length dirty white above.

RAMULARIA EUONYMI, E. & K.—On leaves of *E. atropurpureus*, Manhattan, Ks., Oct. '84. Amphigenous, on dirty white spots, 2—3 mm. in diam., with a dark but scarcely raised border. Hyphæ, arising from a tubercular base, cæspitose, hyaline, simple and subentire or slightly toothed above; conidia concatenate, oblong-cylindrical, mostly 1—septate (occasionally 2—3—septate) hyaline, $20-25 \times 3\mu$. Accompanied by minute, black, immature perithecia scattered over dead parts of the leaf the whole being probably the conidial and pycnidial stage of some *Sphærella*. This has much the same general appearance as *Cercospora Euonymi*, Ell., but the spots are larger and more irregular in shape without any distinct colored border, and the character of the conidia show it to be quite distinct from that species.

ASCOCHYTA ATRIPLICIS, Desm. var. **EFFUSA**, E. & K.—On fading leaves of *Atriplex*, Great Bend, Ks., Aug '84. Differs from the normal form in the absence of spots, the perithecia $100-120\mu$ in diam., being evenly scattered over the surface of the leaves and filled with oblong-cylindrical 1—septate, slightly constricted, brownish, $8-12 \times 4-5\mu$ spores.

GLEOSPORIUM FUSARIOIDES, E. & K.—On leaves of *Asclepias Cornuti*, Great Bend, Ks., Aug. '84. Spore masses $\frac{1}{4}$ — $\frac{3}{4}$ mm. in diam. Subcuticular, scattered irregularly or collected in groups, in which case the part of the leaf occupied assumes a dark brownish look. The spores ooze out on both surfaces of the leaf but more abundantly above, being of an oblong-cylindrical shape, $20-30 \times 5-6\mu$, filled with greenish granular matter and globose transparent nuclei. The spores spring from elongated cells (basidia) arising directly from the inner surface of the hymen-eal cavity.

ASTERINA CELASTRI, E. & K.—On living leaves of *C. scandens*, Manhattan, Ks., Nov. 1884. Perithecia hypophyllous, either collected in groups or scattered, convex, orbicular, ($\frac{1}{4}$ mm.) black, with a scanty mycelium of brown radiating threads around the base; asci oblong-ovate, $12-15 \times 6-7\mu$, filled with granular matter (immature). The parts of the leaf occupied by the groups of perithecia are a little darker than the surrounding portions.

PHYLLOSTICTA AMARANTHI, E. & K.—On leaves of *A. retroflexus*, Garden City, Ks., Aug. '84. On reddish brown (2–4 mm.) spots with a dark, slightly raised border. Perithecia 6–12 on a spot, epiphyllous, erumpent, rather large; spores oblong-elliptical, 2-nucleate, 9–11 x 3–5 μ . Differs from *P. Chenopodii*, West. in its larger perithecia and spores and in the different character of the spots.

PHYLLOSTICTA ABORTIVA, E. & K.—On leaves of *Menispermum Canadense*, Manhattan, Ks., Nov. '84. Spots brown, suborbicular, ($\frac{1}{2}$ –1 cm.) with a definite darker colored but scarcely raised margin. Perithecia innate, punctiform, minute, black and quite thickly scattered over the spots, visible on both sides of the leaf; spores imperfectly developed.

NEW FUNGI FROM IOWA.

BY J. B. ELLIS AND E. W. HOLWAY.

The species here described were collected by Mr. Holway in the vicinity of Decorah, Iowa, mostly during the summer and fall of 1884.

HYPOCREA CUBISPORA, E. & Hol.—Stroma tuberculiform, obconic, subpubescent below, about 1 cm. broad and $\frac{3}{4}$ cm. high, lemon-yellow within and without, surface punctate with the black ostiola; perithecia peripheral, globose; asci cylindrical containing 8 sububical, dark olive or brownish black, 2-nucleate, 4–6 x 3–4 μ , sporidia, some of which are obscurely uniseptate. On an old log, August.

DIATRYPELLA POPULI, E. & Hol.—Perithecia cartilaginous, ovate or subangular by mutual compression ($\frac{1}{2}$ – $\frac{3}{4}$ mm.) closely packed in an orbicular lens-shaped stroma, 2–3 mm. in diam., dark brown outside, dirty white within and seated on the surface of the inner bark; ostiola short, stout, tips obscurely 4-cleft and united in an obscure black disk or piercing the epidermis separately; asci long clavate, 100–115 x 15 μ ; sporidia cylindrical, yellowish, curved, 10–12 x $1\frac{1}{2}$ –2 μ . The surface of the wood is blackened except directly under the stroma where it retains its light color. On dead limbs of *Populus*, Aug. 1883.

VALSA MENISPERMI, E. & Hol.—Perithecia circinating in a cortical stroma without any circumscribing line, 6–10 in number and about $\frac{1}{4}$ mm. in diam., with membranaceous, coarsely cellular walls; ostiola very short, united and concealed in a circular disk $\frac{1}{2}$ – $\frac{1}{3}$ mm. in diam. and entirely covered by the epidermis through which its outline is seen as a small black circle with a black dot in the center; asci clavate, 70 x 12 μ ; sporidia crowded, cylindrical, yellowish, curved, 15–20 x 4–6 μ . On stripping off the epidermis the perithecia sometimes adhere to it and

sometimes remain buried in the surface of the inner bark, Closely allied to *Valsa ambiens*, Fr., but differs in its larger sporidia and the different nature of its permanently covered disk. On dead stems of *Menispermum Canadense*, October.

PEZIZA (HUMARIA) FUSCOCARPA, E. & Hol.—Sessile, orbicular, 3–4 mm. in diam., outside pruinose-tomentose and olivaceous yellow, disk concave, olive-black, margin incurved; asci linear, $65-80 \times 4\frac{1}{2}-5 \mu$; paraphyses filiform; sporidia uniseriate, ovate-oblong, brown, 2-nucleate, $7-8 \times 3-3\frac{1}{2} \mu$. On an old log, Sept. 1882.

CERCOSPORA RANUNCULI, E. & Hol.—On leaves of *Ranunculus repens*, July, 1884. Forming brown indefinitely limited patches on the under side of the leaves which become dirty-yellowish above, without the formation of any well defined spots. Hyphæ in scattered tufts, brown, continuous, abruptly undulate, crooked and subnodulose above, $75-90 \times 4-4 \mu$; conidia slender, nucleolate, becoming 4–5-septate, $70-85 \times 3-4 \mu$.

CERCOSPORA VICIÆ, E. & Hol.—On leaves of *Vicia sativa*, Chicasaw Co., Iowa. On light brown, purplish bordered spots and irregularly shaped, dead areas of the leaf. Hyphæ densely tufted, continuous, brown, entire or slightly denticulate above, short ($25-30 \times 3-4 \mu$); conidia cylindrical, granular, becoming 3-septate, $30-40 \times 3-3\frac{1}{2} \mu$. Differs from *C. Lupini*, Ck. and *C. Phaseolorum*, Ck., in its definitely limited spots. The former also has the hyphæ branched much as in *C. racemosa*, E. & M.

CERCOSPORA OMPHAKODES, E. & Hol.—On leaves of *Phlox divaricata*, var. *Laphami*. Aug., 1884. Amphigenous but more abundant below, on round ($5-6 \mu$) brown spots which are mostly included in pale-brown dead areas of the leaf. Hyphæ brown, continuous or faintly septate, abruptly bent, subgeniculate and imperfectly dentate above, $60-75 \times 3 \mu$; conidia brownish, cylindrical, mostly about $50-60 \times 3-3\frac{1}{2} \mu$, faintly 5–6 septate.

The specific name alludes to the tardy maturing of the conidia which remain for some time granular and faintly 1–2-septate.

CERCOSPORA ANTIPUS, E. & Hol.—On leaves of *Lonicera flava*. August. Amphigenous but mostly hyphophyllous, on round (3–4 mm.) spots, dirty gray above and ferruginous-brown below, with a rather broad, raised, dark colored border. Hyphæ fasciculate, brown undulate and subgeniculate, imperfectly toothed above; conidia cylindrical or clavate-cylindrical with a pale yellowish tint, becoming faintly 3–5-septate, $30-45 \times 2\frac{1}{2}-3 \mu$. *Sphaerella Clymenia*, Sacc. occurs on the upper surface of the spots.

CERCOSPORA GALII, E. & Hol.—On leaves of *Galium aparine*, July. Mostly hyphophyllous, on dead grayish-brown definitely limited spots and areas of the leaves. Hyphæ simple, continuous, brown, undulate and geniculate above, $35-50 \times 3-4 \mu$, forming dense tufts arising from a tubercular base; conidia cylindrical, continuous (becoming septate), brownish, nucleolate, $30-40 \times 3\frac{1}{2} \mu$, nearly straight.

CERCOSPORA GRANULIFORMIS, E. & Hol.—On leaves of *Viola cucullata*. July. Amphigenous, on large (1 cm.) round, indefinitely limited brown spots. Hyphæ short ($15-25 \times 3 \mu$) continuous, brown, nearly straight, obtuse and entire at first, becoming subundulate and somewhat toothed above, densely compacted into small (75μ) sphaeriæform tufts scattered quite thickly over the spots and resembling minute perithecia, brownish at first but at length black, conidia cylindrical, straight, brownish, 1-3-septate, $17-85 \times 2\frac{1}{2}-3 \mu$. Allied to *C. sphaeriæformis*, Ck., but quite different from *C. Viola*, Sacc.

CERCOSPORA MONOICA, E. & Hol.—On *Amphicarpæa monoica*. July. Epiphyllous, forming clusters of minute, snuff-brown tufts on brown, dead spots with a yellow shaded border, and on the green parts of the leaf which soon become yellowish and finally brown. Hyphæ densely tufted, pale brown, continuous, abruptly undulate and denticulate above, $35 \times 2\frac{1}{2} \mu$; conidia slender, nearly straight, yellowish, granular becoming indistinctly 3-8 septate. Differs from *C. tuberosa*, E. & K. (which is the same as *C. glaucescens*, Winter in Rabh. F. Eur. 3080) in its epiphyllous growth, larger tufts of hyphæ and in its shorter, narrower, and less distinctly septate conidia.

RAMULARIA ASTRAGALI, E. & Hol.—On *A. Canadensis*. July. Spots 2-4 mm. in diam., lead colored below, brown above (3-6 mm.); hyphæ hypophyllous, fasciculate, continuous or faintly septate, nearly hyaline but with a faint yellowish tinge, undulate and subgeniculate above, $80-112 \times 8-4 \mu$, conidia oblong-elliptical, uniseptate, hyaline, $15-22 \times 7-9 \mu$.

SEPTORIA BRUNELLÆ, E. & H.—On leaves of *Brunella vulgaris*. July. Spots dark rusty brown. Sharply defined with a narrow, raised border; perithecia thickly scattered over the upper surface of the spots, black, slightly prominent, $100-130 \mu$ in diam., spores linear-clavate, subfuscous, multiseptate, nearly straight, $40-75 \times 1\frac{1}{2}-2 \mu$.

SEPTORIA PACHYSPORA, E. & Hol.—On leaves of *Zanthoxylum Americanum*. August. Perithecia epiphyllous, black, ($100-130 \mu$), on snow white, thin, small (1-2 mm.) subangular or nearly round spots surrounded by a broad, purplish shaded border; spores arcuate-fusiform, 4-6 septate, $35-60 \times 3 \mu$, with a greenish yellow tinge.

GYMNOSPORIUM HARKNESSIOIDES, E. & Hol. - On leaves of *Phryma leptostachya* and on various other living leaves. July, 1884. Spores also from Kansas on leaves of *Rosa lucida*, by Dr. W. A. Kellerman, Nov. 1884. Spores superficial and naked, collected in little heaps appearing like small black specks scattered sparingly over both sides of the leaf but more abundantly below, elliptical $20 \times 12 \mu$, dark brown with an obtuse, short, hyaline apiculus at each end.

It is quite probable that these are only the spores of some other fungus accidentally scattered on the leaves, and it is given here more especially to call attention to it in order to ascertain its true character.

NORTH AMERICAN GEASTERS.

BY A. P. MORGAN.

NOTE.—This article in a more popular form and with illustrations appeared in the *American Naturalist* for October, 1884. The authorities on the subject are chiefly Fries' *Systema Mycologicum* and Dr. Cook's *Grevillea*, Vol. II. page 77 with the Illustrations.

GEASTER, Mich. EARTH-STAR.—Receptacle double, consisting of an outer and an inner peridium; outer peridium stellately divided into several segments; inner peridium dehiscing by a mouth at the apex; spores globose, echinulate.

- A. Pedicels several, 1.
- B. Pedicel single :
 - a. Mouth sulcate-plicate, 2, 3.
 - b. Mouth ciliate-fimbriate, 4, 5.
- C. Pedicel wanting, spores small.
 - c. Mouth sulcate-plicate, 6, 7.
 - d. Mouth ciliate-fimbriate:
 - a. Plants large, 8-10.
 - b. Plants small, 11-13.
 - e. Mouth dentate, 14.
- D. Pedicel wanting, spores large.
 - f. Mouth ciliate-fimbriate, 15.
 - g. Mouth lacerate, 16-18.
- A. *Inner peridium with several pedicels and numerous mouths.*

1. G. COLIFORMIS, Pers. Outer peridium multifid; inner peridium depressed-globose, $1\frac{1}{2}$ —2 inches in diameter, the mouths ciliate; spores .0050 mm. Colorado, Prof. Chas. H. Peck.

- B. *Inner peridium with a single pedicel, mouth one.*
 - a. *Mouth sulcate-plicate.*

2. G. FORNICATUS, Fr. Outer peridium double, subquadrifid; inner peridium subglobose, $\frac{1}{2}$ —1 inch in diameter; spores .0035—.0040 mm. Carolina, Curtis; Schweinitz under *G. quadrifidum*.

3. G. BRYANTII, Berk. Outer peridium single, multifid; inner peridium sub-globose, $\frac{3}{4}$ —1 inch in diameter; spores .0040—.0045 mm. New York, Prof. Chas. H. Peck.

- b. *Mouth ciliate-fimbriate.*

4. G. LIMBATUS, Fr. Inner peridium subglobose, brownish, $\frac{3}{4}$ —1 inch in diameter; spores .0040—.0045 mm. Alabama, Peters; Carolina, Curtis; New England, Frost; Ohio.

5. G. MINIMUS, Schw. Inner peridium ovoid, white, about $\frac{1}{4}$ of an inch in diameter; spores .0040—.0045 mm. East and South.

- C. *Inner peridium sessile, the spores small, .003—.005 mm.*
 - c. *Mouth sulcate-plicate.*

6. *G. STRIATUS*, D C. Inner peridium depressed-globose, about $\frac{1}{2}$ an inch in diameter, the mouth prominent; spores .0035—.0040 mm. Carolina and Penn., Schweinitz under *G. pectinatum*? New York, Peck; California, Harkness; Illinois, Andras; Ohio.

7. *G. UMBILICATUS*, Fr. Inner peridium depressed-globose, about $\frac{1}{2}$ an inch in diameter, the mouth in a depressed marginate disk; spores .0035—.0040 mm. New Jersey, J. B. Ellis.

d. *Mouth ciliate-fimbriate.*

a. *Plants large.*

8. *G. RADICANS*, B. & C. Outer peridium separating into two coats, the inner coat vaulted; inner peridium reddish, $\frac{3}{4}$ of an inch in diameter; spores —? Carolina, Curtis, Ravenel.

9. *G. TRIPLEX*, Jungh. Inner part of the outer peridium separating and forming a cup; inner peridium pallid; $\frac{3}{4}$ —1 $\frac{1}{2}$ inches in diameter; spores .0050—.0055 mm. Michigan, Færste; Ohio.

10. *G. FIMBRIATUS*, Fr. Outer peridium single; inner peridium wanting the circular disk in which the determinate mouth of other species is situated; spores .0030—.0025 mm. East and South; California, Harkness.

b. *Plants small.*

11. *G. VITTATUS*, Kalch. Lower surface of the segments of the outer peridium longitudinally rimose, so as to appear white-vittate; otherwise not different from the next. Ohio.

12. *G. SACCATUS*, Fr. Inner peridium globous or depressed-globose, $\frac{1}{2}$ — $\frac{3}{4}$ of an inch in diameter, the mouth determinate; spores .0030—.0035 mm. East and South; Ohio. Perhaps the most common Geaster.

13. *G. LAGENÆFORMIS*, Vitt. Inner peridium ovoid, $\frac{1}{2}$ an inch or less in diameter, the mouth determinate; spores .0030—.0035 mm. Ohio.

e. *Mouth dentate.*

14. *G. RUFESCENS*, Pers. Inner peridium subovoid, the mouth determinate; spores .0040—.0045 mm. Carolina, Schweinitz; California, Emory.

D. *Inner peridium sessile, the spores large, .008—.010 mm.*

f. *Mouth ciliate-fimbriate.*

15. *G. MAMMOSUS*, Chev. Segments reflexed when dry; inner peridium depressed-globose, the mouth conic-acute in a circular disk; spores .008—.010 mm. California, Harkness.

g. *Mouth lacerate.*

16. *G. HYGROMETRICUS*, Pers. Segments closely inflexed when dry; inner peridium subreticulate, depressed globose, dehiscing irregularly; spores .008—.010 mm. East and South; Wisconsin, Dr. Brown; California, Harkness.

17. *G. FIBRILLOSUS*, Schw. Outer peridium externally fibrillose-scaly, the segments inflexed when dry; inner peridium smooth, subglobose; spores —? Closely related to the preceding. Pennsylvania and Carolina, Schwenitz.

18. *G. LINKII*, Spreng. Both the inner and outer peridia at first fleshy then rigid and multifid; spores —? Pennsylvania and Carolina, Schwenitz under *Actinodermium Sterrebeckii*, Nees.

NEW LITERATURE.

BY W. A. KELLERMAN.

WHARTON, HENRY THORNTON, "On Fries' Nomenclature of Colors," in *Grevillea*, Dec. 1884.

This consists of an examination of the epithets used by Fries in describing the coloration of the "Agaricini," and was read before the Woolhope Naturalists' Field Club, Oct. 13, 1884. Mr. Wharton enumerates only those found in the "Hymenomycetes Europæi," and the list, excluding reference to compound names, reaches nearly 200. His complete list, as originally made, amounted to 840. To collect these he had to perform the laborious task of reading 20,000 lines of concisely-written Latin. The enumeration includes "not only the color-names used for descriptive purposes by Fries himself, but also most of those used as specific. And in making specific names there is a natural tendency to use a color-name synonymous with another, simply from the fact of the most obvious one having been already used. For instance, a describer wishes to name a white species *Agaricus albus*; but when he finds that name is preoccupied, he names his species *Ag. candidus*. Still we need not conclude that he had the strict classical Latin differences of the two words in his mind's eye; he probably never thought that *Ag. albus* was so named because it was of a dead white, nor in speaking of *Ag. candidus* need he have meant to imply that it was of a glistening white, as Cicero might have done."

Another difficulty that Mr. Wharton met with lies in the fact that color-names were used in classical times with considerable indefiniteness. Again, "much of the difficulty that surrounds the nomenclature of colors is also due to there being no authoritative code. In each branch of art or knowledge at the present day, different names are used for the same colors. The 'purple' of the cardinal is crimson; the 'pink' of the huntsman is scarlet. An artist calls his colors by the names under which he buys them," * * * "consequently mycologists must

be a law unto themselves, and if we are willing to hold the illustrious Fries as our law-giver, we must study, not so much what color-names *should* mean, as in what sense he used them."

Of course no "review" of so important a paper can do it justice nor give the reader a clear idea of its contents. For this, one must have access to the original. Nevertheless, a partial list of the color-names, with the elucidation in Mr. Wharton's own words, may with propriety here be offered:

Of the Whites,

Albus, meaning a dead white, as distinct from *candidus*, a shining white, has little prominence in Fries' description.

Albellus, *albescens*, *albidior*, *albidus*, and *albineus* can only express the idea of whiteness, but seem used rather for "whitish."

Albicans and *candicans* should strictly mean becoming white.

Argenteus and *argyraceus* are a silvery white, silvered.

Dealbatus, whitewashed or plastered.

Cerussatus, colored with white lead.

Eburneus, ivory-white

Ermineus, ermine-white

Niveus, snow-white

Virgineus, virgin or pure white

} have no more distinction than the English terms by which they are naturally translated.

Of pure Greys

Canus and *incanus* are the nearest to white.

Cinereus is the grey of wood-ashes,

cinerascens is becoming such a grey;

griseus seems to be a little darker, and

livivius a darker still and inclining to brown.

Cretaceo-pallidus is a pale, chalky grey.

Nigrescens and *nigricans* do no mean so much dark grey as a grey that turns black with age.

Of Greys that incline to Blue,

Cæsius is the palest, (classical term for blue-grey of the eye.)

Glaucus is a grey that inclines to green, and

glaucescens denotes a paler shade of the same color.

Livens and *lividus* are bluish or leaden-grey, much like *molybdus* and *plumbeus*

Ardosiacus is a dull lead-color.

Chalybæus is a steel or iron-grey; Fries, under *Cortinarius sciophyllus* explains it as *cæruleo-fuscus*, dusky blue.

Of the Brown-Greys,

Murinus, mouse-color, is the palest.

Argillaceus is a light brownish ash-color.

Fuscus, dusky, is rather a vague term, but it is almost too brown to be classed under the greys at all.

Fuscescens, means becoming dusky.

Ravidus, is a dark grey.

Fumosus, *fuligineus* and *fuliginosus* are best translated smoky, and not, as the latter might be, sooty black.

Of Blacks,

Ater is strictly a lustreless black, and

niger is a glistening black.

piceo-ater, black as pitch, } come into the former category ;
fuscus, swarthy }

coracinus, raven-black, with a tinge of blue, into the latter.

Atratus and *pullatus* mean simply "clothed in black."

Denigratus, "blackened," is used for a dark, dusky brown.

Of Pale Yellow, the type seems to be

luteus, like the flowers of woad (*Isatis tinctoria*) ;

luteolus and *sulphureus*, sulphur yellow, are paler than this.

Stramineus, straw-colored, denotes a paler and less pure yellow (Naples yellow), of which

cerinus is a deeper, darker shade,

croceus, saffron yellow, being a fuller shade.

Citrinus is our lemon-yellow, yellow of wax.

Of Full Yellow,

Flavus, gamboge-yellow, is the type ; which is *flavissimus* at its fullest brilliancy.

Flavidus is a paler yellow, purer and richer than *luteus*.

Vitellinus, like the yolk of an egg. Not far off *flavus* is

aureus, gold-colored, which seems to me most like the Cadmium yellow of artists ; its diminutive

aureolus, does not seem to be a very different shade.

Galbanus, the color of the gum galbanum, is a greenish yellow.

Of Orange-Yellows,

aurantius being a full orange, Cadmium orange, and

aurantiacus a paler orange containing less red.

Igneus and *flammeolus*, denoting the color of flame, and

fulmineus, that of lightning, come in this place, but seem to have no very certain application.

Persicinus and *persicolor*, are difficult to describe more intelligibly than by peach color.

Armeniaceus, apricot-colored, is explained by Fries as tawny-cinnamon (fulvo-cinnamomeus) or yellowish-tan (helvolo-alutaceus).

Of Yellow-Browns,

cinnamomeus, cinnamon, a light yellowish brown, is the palest.

Gilvus is a yellower shade.

Alutaceus seems best translated by buff or tan ;

helvolus is lighter and yellower.

Crustulinus seems to be the color of toast.

Ochraceus is yellow-ochre, and

melleus, honey-yellow, is dingier and less yellow ;
luridus, sallow or wan, is still paler and less yellow, almost like that
 which builders call "stone-color."

Rhabarbarinus is the light brownish yellow of Turkey rhubarb.

Isabellinus is a light brownish yellow or dirty cream color.

Cervicolor, *cervinus* and *hinnuleus* all seem to mean the same thing
 (fawn-color.)

Icterius or *icterinus* denotes a brownish, ochery yellow color known
 to artists as "gall-stone," only with an inclination to a dirty
 green.

Of Red Browns

lateritius is the brightest, the color of old red tiles.

Testaceus, brick-colored, is a reddish brown or rusty bay, almost
 Venetian red.

Fulvus is tawny, the color of a lion, and is also known as *leoninus*
 and *leochromus*.

Helvus is a light bay, or "cow-color," like *vaccinus*.

Badius is a reddish brown, the color of a "bay" horse ;

spadiceus, date-brown, is a duller and darker shade.

Hepaticus, liver-colored, is a darker and redder brown than bay.

Ustalis denotes a warm, reddish bay, between red ochre and brown
 madder.

Of True Browns

brunneus, Vandyke-brown, is the type.

Coffeatus, like roasted coffee, is very similar.

Ligneo-brunneus is a lighter or wood brown.

Umbrinus is a dark brown, brown umber, the color of a "brown"
 horse.

Of Reds

carneus is the palest, with *Carneolus* and *incarnatus*, flesh-colored.

Roseus and *rosaceus* imply a rosy pink ;

rosellus seems to mean inclined to pink.

Coccineus, cochineal red, is a deeper scarlet, carmine.

Sanguineus, blood-red, is nearly similar.

Rufus, *ruber* and *russus* are less pure reds.

Rubescens is merely becoming red.

Rubellus, *rufidulus*, *rufulus* are reddish.

Rubens is a brick-red ; *rutilus*, *rutilans* a purplish brick-red.

Ferrugineus and *rubiginosus* rust-red.

Puniceus is an almost purple red.

Blues.

Cæruleus is a pale blue azure.

Azureus, *lazulinus*, and *cyaneus* are rather ultramarine.

Cyanellus is almost a sky blue.

Purpureus is a bluish purple.

Violaceus, violet, is a reddish purple.

Lilacinus is lilac or mauve.

Green.

Viridis, this type of the greens is of indefinite hue.

Ærugineus and *æruginosus* refer to a verdigris or rather blueish green.

Olivaceus is olive green ;

olivascens denoting the preliminary stage of becoming green.

ELLIS, J. B. & KELLERMAN, W. A.—“Kansas Fungi;” in Bulletin of the Torrey Botanical Club, Oct. 1884.

Thirteen new species collected in the vicinity of Manhattan, Kansas, from May to September, 1884, are described : *Æcidium Æsculi*, E. & K., on leaves of *Æsculus glabra* ; *Æcidium verbenicola*, E. & K., on leaves of *Verbena urticæfolia* and *V. stricta* ; *Æcidium Ceanothi*, E. & K., on leaves of *Ceanothus ovalis* ; *Phyllosticta Cornuti*, E. & K., on withered or dead leaves of *Asclepias Cornuti* ; *Phyllosticta verbascicola*, E. & K., on leaves of *Verbascum Thapsus* ; *Septoria Leptostachya*, E. & K., on leaves of *Phryma Leptostachya* (Ohio) ; *Septoria Cephalanthi*, E. & K., on leaves of *Cephalanthus occidentalis* ; *Septoria Stenosiphonis*, E. & K., on leaves of *Stenosiphon virgatus* ; *Isaria xylarioides*, E. & K., on dead wood ; *Cercospora Isanthi*, E. & K., on leaves of *Isanthus cæruleus* ; *Cercospora tuberosa*, E. & K., on leaves of *Apios tuberosa* ; *Cercospora oculata*, E. & K., on leaves of *Vernonia Baldwinii* ; and *Cercospora Teucrii*, E. & K., on leaves of *Teucrium Canadense*.

TRELEASE, WILLIAM. “Preliminary List of the Parasitic Fungi of Wisconsin ;” reprinted from the Transactions of the Wisconsin Academy of Sciences, Arts and Letters, Vol. VI., 1881-4.

In this interesting and valuable catalogue are given two hundred and seventy species of Fungi together with their host-plants. The genera most numerous represented by species are as follows : *Peronospora* 20. *Microsp hæra* 8, *Ramularia* 7, *Cercospora* 7, *Phyllosticta* 7, *Septoria* 20. *Uromyces* 13, *Puccinia* 42, isolated *Uredo* forms 7, isolated *Æcidial* forms 27, *Ustilago* 8 and *Entyloma* 8 species. Thirteen new species are described as follows :

OVULARIA PYROLÆ, Trelease.—On leaves of *Pyrola rotundifolia*, L. Spots circular, dark. Spores colorless, round-oval to oblong, frequently acute at one end, unicellular. Usually $4 \times 12 \mu$; extremes noted ; $3.5-6 \times 6-17 \mu$.

CLADOSPORIUM TRIOSTEI, Pk.—On leaves of *Triosteum perfoliatum*, L. Spots indefinite, pale, becoming brown at the center with age ; 2-5 mm. in diameter. Conidiophores tufted, slightly wavy, hypophyllous, 125-150 μ long, 3.5 μ in diameter, deep brown. Spores dark brown, sometimes slightly paler than the threads ; lemon-shaped, with strongly pronounced papillæ at either end ; 2-celled ; $5-7 \times 15-20 \mu$. Septum usually central, sometimes near one end.

GLEOSPORIUM (MARSONIA) MELILOTI, Trelease.—On stems of *Melilotus alba*, Lam. Perithecia minute, inconspicuous, occurring in longitudinal rows, 2–5 mm. long, on the stem. Spores oozing out in pale, flesh-colored tendrils, under the microscope appearing colorless; oblong, straight or slightly curved, 2-celled, 5–6 x 13–20 μ . In the smaller spores the septum is nearly central, in the larger ones it occurs nearer one end.

PHYLLOSTICTA DODECATHEI, Trelease.—On leaves of *Dodecatheon Media*, L. Spots circular, brown, about 3 mm. in diameter. Spores hyaline, ovoid to oblong, sometimes nearly spherical, eguttulate, 2–5 x 3.5–7 μ , unicellular.

PHYLLOSTICTA APOCYNI, Trelease.—On leaves of *Apocynum cannabinum*, L. Spots circular, brown, about 3 mm. in diameter. Perithecia small, black. Spores colorless, oblong, 3.5–4 x 5–7 μ , unicellular.

ASCOCHYTA OXYBAPHI, Trelease.—On leaves of *Oxybaphus nyctagincus*, Sweet. Spots dark brown, roundish, 1–2 mm. Perithecia on the upper surface of the leaf, small, brown, carbonized about the orifice. Spores colorless, 2-celled, 4 x 10–17 μ ; sometimes constricted at the middle.

ASCOCHYTA SPARTINÆ, Trelease.—On leaves of *Spartina cynosuroides*, Willd. This species was found in small quantity, in company with *Uromyces acuminatus*, Arthur, and causes small, rounded, pale yellow spots on the leaves. The spores ooze out in flesh-colored masses, and are colorless, straight or slightly curved, usually a little narrower at one end than the other. They average 3 x 35 μ . As a rule they are 2-celled, but in a few instances two or three septa were distinguished. Perhaps identical with some of the numerous described *Septoriæ* or *Ascochytae* of grasses; but I have been unable to place it.

ASCOCHYTA SALICIFOLIÆ, Trelease.—On leaves of *Spiræa salicifolia*, L. Spots numerous, rounded, about 1 mm. in diameter, deep flesh colored. Perithecia large, similarly colored. Spores oozing out; hyaline, fusiform, usually a little curved in form of a crescent, 1-septate, with several (3–4) oil-drops; 2–3.5 x 30–50 μ . Referred at first to *Septoria ascochytoïdes*, Sacc., but differs in the absence of a darker border to the spots, while the spores are twice as long as in that species, where they are said to measure 18–20 x 2.5–3 μ . Perhaps, like the last, more properly a *Septoria* than an *Ascochyta*.

PUCCINIA TOMIPARA, Trelease.—Uredo and teleutospores on a species of *Bromus*, apparently *B. ciliatus*, L. II. Sori small, round, or little elongated, on the upper surface of the leaf. Spores commonly round, somewhat roughened with blunt, inconspicuous warts, pale yellow, 22–26 μ . III. Sori compact, black, long, covered by the epidermis; round or slightly elongated, usually about .2 mm. in diameter. Spores pale chestnut-brown, thin-walled, without apical thickening; irregularly oblong, sessile; 2–5 celled, often tomiparous; 13–22 x 35–43 μ . This species is remarkable from the fact that the spores are commonly 3–4 celled, with the uppermost septum oblique or not unfrequently parallel

to the axis of the spore, which is thus made to consist of more than one row of cells. It somewhat resembles *P. triarticulata*, B. & C., which occurs on *Elymus*, and which has 3-celled spores; but these are longer and differently shaped.

PUCCINIA PETALOSTEMONIS, Farlow, *in litt.*—Uredo and teleutospores on *Petalostemon*. II. Sori round, brown, surrounded by the ruptured epidermis, which is elevated so as to form a false-peridium. Spores pale brown, ovoid, nearly smooth or somewhat granular on the surface. Average size $20 \times 22 \mu$. III. Sori similar to those containing the uredospores, black. Spores medium brown, broadly ellipsoidal, slightly constricted, thin-walled, without apical thickening, surrounded by a smooth gelatinous sheath; average $20 \times 33 \mu$. The species is related to *P. amorphæ*, Curt., but readily distinguished by the paler and more transparent teleutospores, and the thinner, smooth envelope. Pale-amber paraphyses, frequently hooked at the tip, accompany both uredo and teleutospores.

PUCCINIA ZYGADENI, Trelease.—Teleutospores on *Zygadenus glaucus*, Nutt. Sori small, rounded; on both sides of the leaf. Spores amber-brown, darker at the apex, on thin-walled, colorless pedicels; oblong or sometimes clavate; but slightly constricted. Apex thickened, usually rounded or truncate, rarely acute, $16-20 \times 33-56 \mu$; commonly about $17 \times 43 \mu$. This resembles a specimen in the Curtis herbarium, on *Ami-anthemum*, which is labelled *P. asphodeli*, Duby. "It corresponds closely to a specimen from France, bearing the same name, but evidently incorrectly named, as other specimens from France and Italy, with the same name, are quite different." (Farlow, *in litt.*)

ÆCIDIUM DICENTRÆ, Trelease.—On leaves of *Dicentra cucullaria*, DC., in company with *Peronospora Corydalis*, DeBary. Hypophyllous, scattered. Spots none. Peridia short, pale yellow, irregularly torn or finely, many-lobed, .3 mm. in diameter. Peridial cells granulated, polygonal, more or less isodiametric, averaging $18 \times 15 \mu$. Spores deep orange, thin-walled, smooth, nearly spherical or somewhat polygonal; $13 \times 20 \mu$, usually about 16μ ; wall colorless. A beautiful species collected by Mr. Pammel in May, 1884. The æcidia are accompanied by small violet or brown spermogonia, like those of *A. punctatum*.

ÆCIDIUM PAMMELII, Trelease.—On leaves of *Euphorbia corollata*, L. Spots brown, little, if at all thickened, slightly pustulate, with a central cluster of a few spermogonia. Cluster cups usually hypophyllous, concentrically arranged, rarely a few, epiphyllous. Peridium short, whitish, border narrow, about 10-lobed. Peridial cells colorless, rugose, usually nearly isodiametric, $20-25 \mu$. Spots red-orange, polygonal, isodiametric or commonly some what elongated, $20-25 \mu$. The spots are generally orbicular, or elliptical with the longer axis parallel to the midrib. When the spermogonia appear near the margin of the leaf, or near the midrib, the spot naturally develops in but one direction. The species differs from the æcidium of *Uromyces Euphorbice*, C. & P. in the regular arrangement of the cluster cups on round spots, and from the other æcidia occurring on this genus in not deforming the host plant.

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No. 2.

ENUMERATION OF THE NORTH AMERICAN CERCOSPORÆ.

WITH DESCRIPTIONS OF THE SPECIES.

BY J. B. ELLIS AND BENJAMIN M. EVERHART.

The genus *CERCOSPORA* which was established by Fresenius about thirty years ago, comprised at first only a few species, taken mostly from several other genera in which they did not seem properly to belong. In his *Beitrage zur Mycologie* (1863) he describes four species. Fuckel, in his *Symbolæ Mycologicæ* (1869), enumerates ten species. Saccardo, in the first volume of *Michelia*, mentions and describes thirty-eight species, and in the second volume (1882) adds about twenty more. Thirty-seven additional species have been described by Cooke in *Grevillea*. Peck, in the *Reports of the N. Y. State Museum* has added about a dozen, while Von Thumen, Dr. Winter, and various others, including the writers of this article, have further contributed to swell the number of published species, till the list has become almost formidable. And now, before this rapidly accumulating mass of new and old species shall become entirely unmanageable, we have thought it might be well to "take an account of stock," to see, if possible, how we stand. With this object in view, we have made this "Enumeration" of the species thus far described in this country. We have tried to reduce and condense the list as far as consistently could be done, and, if we have failed to do this satisfactorily our labor still will not be lost, for, by bringing the scattered fragments together into one body, we have made it easier for others to carry on and complete the work which is here begun.

CERCOSPORA (Gr. *kerkos* a tail, and *spora* a spore) is a genus of

Hyphomycetous fungi growing mostly on living leaves, generally on dead or discolored spots, and consisting of little tufts of erect, brown, or sometimes nearly colorless (hyaline) threads (hyphæ) bearing terminal or (exceptionally) lateral, elongated, septate, pale brownish or hyaline spores (conidia) which are generally attenuated above. The hyphæ arise from a more or less distinct tubercular base and are generally undulate above or are abruptly bent this way and that, or imperfectly toothed and swollen at intervals (nodulose) and occasionally sparingly branched. The conidia are, for the most part, terminal, but occasionally arise also from little tooth-like projections on the sides of the hyphæ below the apex. They are cylindrical, hyaline and without septa (continuous) at first but soon become elongated and septate, and are usually attenuated above, often very distinctly so, and at maturity become slightly brownish, but in most of the species this brown tint is so faint that the conidia are called hyaline. There are, however, species with decidedly brown conidia (Nos. 25, 27, 101.)

CERCOSPORA is confluent on one side with *Helminthosporium* from which it differs in its less rigid and paler hyphæ and conidia, and on the other with *Ramularia* which has both hyphæ and conidia hyaline. Probably none of the species are autonomous, being apparently only the conidial stage of various species of *Sphærella* or other sphæriaceous fungi.

Thanks are due to Dr. Geo. Martin, of West Chester, Pa., who has carefully examined many of the species here described and placed his notes at our disposal.

The species may be grouped, for convenience, according to the presence, absence, color, etc., of the spots.

A. Hyphæ brown.

- a. Spots orbicular or suborbicular, gray, cinereous or white, 1-19.
- b. " " " " brown, at least when young, 20-50.
- c. Spots angular or irregular, 51-65.
- d. Spots indefinite. 66-75.
- e. Spots none, or at least not very conspicuous.
 - a. Tufts scattered, 76-82.
 - b. Tufts effused, 83-101.

B. Hyphæ nearly hyaline (*Cercospora*, Sacc.), 102-103.

C. Species standing ambiguously between CERCOSPORA and RAMULARIA, 109 et seq.

A. Hyphæ brown.

- a. Spots orbicular or suborbicular, gray, cinereous or white.

1. CERCOSPORA FLAGELLARIS, E. & M., Am. Nat., Dec. '82, p. 1003. N. A. F., 1256.

Spots pallid-white (2-8 mm.) with a narrow, raised, reddish brown border, round or irregular, often confluent, mostly on withered parts of the leaf. Hyphæ tufted, brownish, undulate and nodulose above, 75-80

x 4 μ . Conidia slender, attenuated above, 8–10 septate, 80–112 x 4 μ . Amphigenous, but more perfectly developed on the lower surface of the leaf.

On leaves of *Phytolacca decandra*, from various localities.

2. CERCOSPORA DIANTHERÆ, E. & K., Jour. of Mycol., I. p. 2.

On round, white spots (2–4 mm.) and mostly included in or surrounded by brown, dead areas of the leaf which again are either indefinitely limited or are bounded by a definite, darker, narrow border. Tufts small, loose, spreading, of only a few threads each (3–12), on the white spots. Hyphæ brown, continuous or sparingly and faintly septate, geniculate and toothed above, 60–80 x 4 μ . Conidia slender, linear obclavate, 80–120 x 4–5 μ , multiseptate, hyaline. Allied to the preceding.

On leaves of *Dianthera Americana*, Sept., Kansas (Kellerman.)

3. CERCOSPORA VIOLÆ, Sacc., F. Ven. nov. vel. crit., V p. 187.

Spots suborbicular, dry and pale. Hyphæ amphigenous, short, simple, fuscous, 30–35 x 4 μ . Conidia very long, 150–200 x 3½ μ , wand-shaped, multiseptate, hyaline.

On leaves of Violet, August, N. Y. (Peck), Iowa (Holway.)

4. CERCOSPORA CHENOPODII, Fres. Beitrag. p. 92. Michelia, vol. II., p. 364. Exsiccati, de Thum, M. U., No. 374. Rav. Fungi Amer., 591. Ellis N. A. F., 550.

Hyphæ amphigenous, fasciculate, simple or 1-septate, 40–50 x 5–6 μ , brown. Conidia subcylindrical, ends subobtuse, slightly curved, 60–70 x 6–8 μ , 4–5 septate, with a brownish shade, on pale, thin, light-colored spots ¼–½ cm.

On leaves of *C. album* and probably other species of *Chenopodium*. Common.

5. CERCOSPORA PLANTAGINIS, Sacc., Mich. I., p. 267.

Spots small (1–2 mm.) round, white, thin with a narrow, reddish brown border. Hyphæ fasciculate, brown, septate, 40–60 x 3 μ , forming minute tufts. Conidia slender, obclavate, acute above, multiseptate, hyaline, 80–200 x 3–4 μ .

On leaves of *Plantago lanceolata*, Newfield, N. J., and also on *P. major*, Kansas (Kellerman.)

6. CERCOSPORA PHYSALIDIS, Ell. Am., Nat., Oct. '82, p. 810.

Amphigenous; on white, round, deciduous spots, (1–3 mm.) Hyphæ fasciculate, brown, subnodulose, 45–55 x 5–5½ μ . Conidia clavate, cylindrical, faintly 5–8 septate, hyaline, 65–75 x 4 μ .

On leaves of several species of *Physalis*. From Kentucky and Kansas (Kellerman), to Wisconsin (Trelease).

7. CERCOSPORA EUONYMI, Ell. l. c. N. A. F. 1245.

Amphigenous; on small, round, white spots (1–2 mm.) with a dark purple border. Hyphæ fasciculate, subnodulose, brown, about 60 μ high. Conidia obclavate-cylindrical, 3–5 septate, hyaline, 50–65 x 7–8 μ .

On leaves of *Euonymus Americanus* and *E. Europæus*, Ky. (Kellerman)

8. *CERCOSPORA ASCLEPIADIS*, Ell. l. c. *C. venturioides*, Pk? 34th Rep. N. Y. St. Mus., p. 47.

Amphigenous, but mostly epiphyllous, on suborbicular spots (1—3 mm.) black at first then becoming white in the center, with a definite dark brown or nearly black raised border around which the leaf is stained purplish brown. Hyphæ fasciculate, subnodulose, and sparingly subdentate above, brown, 40—50 x 4 μ . Conidia linear-obclavate, about 5-septate, hyaline, 80—120 x 3½—4 μ .

On *Asclepias Cornuti*. Quite different from *C. clavata*, Ger.

9. *CERCOSPORA TEUCRII*, E. & K. Bull. Torr. Bot. Club, vol. XI. p. 116

Epiphyllous, on brown (1—2 mm.) spots which soon become dirty white with a dark purple shaded border. Hyphæ tufted, brown, crooked and subdentate above, 75—120 x 4 μ , faintly septate. Conidia long and slender, 75—120 x 3—4 μ , faintly septate.

On leaves of *Teucrium Canadense*, Aug., Kansas (Kellerman.)

10. *CERCOSPORA ACALYPHÆ*, Pk. 34th Rep. N. Y. State Mus., p. 48.

Spots very small, orbicular, dry, whitish, with a narrow purplish brown border. Hyphæ epiphyllous, tufted, subflexuous, septate, colored. 54—75 x 5 μ . Conidia slender, rod-like, 5—7 septate, colorless, 50—100 x 3 μ .

On leaves of *Acalypha Virginica*. N. Y. (Pk.), Kansas (Kellerman.)

11. *CERCOSPORA CITRULLINA*, Cke. Grev. XII. p. 31. Rav. F. Amer. 589.

Epiphyllous. Spots orbicular (2—4 mm.) whitish with a purple shaded border. Hyphæ pale-olivaceous, elongated. Conidia very long, attenuated above, sparingly septate, hyaline, 120—140 x 3 μ .

On leaves of watermelon. S. Carolina (Ravenel.)

12. *CERCOSPORA BETICOLA*, Sacc. Fungi Ven. nov. vel. crit. Ser. V. p. 189. N. A. F., No. 48.

Amphigenous. Spots suborbicular arid, grayish (2—3 mm.) with a purplish border. Hyphæ fasciculate, mostly without septa, 40—50 x 4—5 μ , brownish, nodulose above. Conidia narrow, linear, multiseptate, hyaline, 70—120 x 3 μ .

On leaves of cultivated beet. Common.

13. *CERCOSPORA ANTIPUS*, Ell. & Hol. Jour. of Mycol. I. p. 5.

Amphigenous but mostly hypophyllous, on round (3—4 mm.) spots, dirty gray above and ferrugineous-brown below, with a rather broad, raised, dark colored border. Hyphæ fasciculate, brown undulate and subgeniculate, imperfectly toothed above; conidia cylindrical or clavate-cylindrical with a pale yellowish tint, becoming faintly 3—5 septate. 30—40 x 2½ x 3 μ . *Spherella Clymeniae*, Sacc. occurs on the upper surface of the spots.

On leaves of *Lonicera flava*, August, Iowa (Holway.)

14. *CERCOSPORA ZINNIE*, E. & M. n. s.

Spots ½—½ cm. across, consisting of a small (1—1½ mm.) white center

with an indefinite, dirty red-brown margin—or oftener on the brown area appear many small, white, round spots which become at length more or less confluent. Hyphæ epiphyllous, fasciculate, brown, continuous or sparingly septate, $40-60 \times 4-5 \mu$, abruptly bent and crooked above. Conidia oblong or cylindrical, 1–2 septate, $16-30 \times 4 \mu$, hyaline.

On leaves of *Zinnia multiflora*, Florida (Dr. Martin.)

15. CERCOSPORA ISANTHI, E. & K. Bull. Torr. Bot. Club, XI. p. 115.

On round (1 mm.) white spots, with a narrow raised border. Hyphæ tufted ($25-30 \times 4 \mu$), crooked and subdentate above, continuous, brown. Conidia clavate-cylindrical, multiseptate, $75-100 \times 3-4 \mu$. The spots are at first purplish, with a purple shaded border but soon whiten out.

On leaves of *Isanthus cæruleus*, Manhattan, Kas. Aug. (Kellerman.)

16. CERCOSPORA CROTONIFOLIA, Cke. Grev. XII. p. 31. Rav. F. Amer. 593.

Hyphæ epiphyllous, short or obsolete, on round, light colored definite spots (3–4 mm.) Conidia cylindrical, straight, subobtuse, 1–3 septate, hyaline, $28-40 \times 3 \mu$.

On leaves of *Croton glandulosum*. S. Carolina (Ravenel.) This has the general appearance of *C. Chenopodii*, Fres.

17. CERCOSPORA RESEDÆ, Fuckl. Symbolæ Myc., p. 353. N. A. F., 375. *Virgasporium maculatum*, Cke., Grev. III. p. 182., id. IV. p. 69.

Spots pallid, arid, round, (2–4 mm.) with a slightly raised, pale border. Hyphæ amphigenous, cæspitose, simple, continuous or faintly septate, nearly straight below but more or less crooked and irregular above, fuscous, $50-70 \times 4-5 \mu$, forming little grayish tufts thickly scattered over the central part of the spots. Conidia linear-obclavate, 4–5 septate. $100-140 \times 2\frac{1}{2}-3 \mu$, hyaline.

On living leaves of *Reseda odorata*, Penn. (Martin.)

18. CERCOSPORA CANESCENS, E. & M., Am. Nat. Dec. '82, p. 1003. N. A. F., 1249.

Spots brown, becoming gray and dirty white, suborbicular, irregular and confluent ($\frac{1}{4}-\frac{1}{2}$ cm.), mostly on dead portions of the leaf, mostly with a narrow, definite, reddish brown border on the upper side of the leaf. Hyphæ cæspitose, brown, $90-110 \times 5-6 \mu$, forming little black tufts. Conidia obclavate-cylindrical, 5–8 septate, hyaline $100-120 \times 5-6 \mu$, mostly epiphyllous.

On leaves of *Phaseolus* (cult.) Newfield, N. J.

19. CERCOSPORA VERNONIÆ, E. & K. Am. Nat., Nov. '83, p. 1166.

Epiphyllous, on small (1–3 mm.) round, gray or purplish gray spots (which finally whiten out) with a distinct, narrow, raised border which is surrounded by a purplish discoloration. Hyphæ cæspitose, subfuscous, continuous, subnodulose and subdentulate above, $25-40 \times 4-5 \mu$. Conidia slender, clavate, 6–9 septate, $75-100 \times 3-4 \mu$.

On leaves of *Vernonia Baldwinii*, Kansas (Kellerman.)

This differs from *C. oculata*, E. & K., in the different character of the spots and its longer and more distinctly septate conidia.

b. *Spots orbicular or suborbicular, brown.*

20. *CERCOSPORA OCLATA*, E. & K. Bull. Torr. Bot. Club, XI. p. 116.

Mostly epiphyllous, on dirty brown spots (.25—.75 cm.) with a definite, slightly raised, narrow, darker border; hyphæ cæspitose, short (25—30 x 4 μ) obtuse, simple, brown, continuous, entire or slightly denticulate above; conidia at first oblong and 1-septate, 20—30 μ long, at length attenuated below and becoming 30—60 x 3—4 μ and faintly 3-septate.

The spots are often concentrically wrinkled and sometimes confluent, forming patches 2—3 cm. across.

On leaves of *Vernonia Baldwinii*. July. Kansas (Kellerman.)

21. *CERCOSPORA CALLÆ*, Pk. & Clinton. 29th Rep. N. Y. State Mus. p. 52. N. A. F., No. 1253.

Spots definite, oblong, pale ($\frac{1}{2}$ —1 x $\frac{1}{4}$ cm.) with a reddish brown border. Hyphæ amphigenous, short, flexuous, somewhat nodulose, not at all or indistinctly septate, slightly colored, cinereous or subolivaceous in the mass, growing in minute, scattered tufts. Conidia cylindrical or obclavate, at first continuous then elongated and 1—5 septate, nearly straight, 30—75 μ long.

On living leaves of *Calla palustris*. Aug. Buffalo, N. Y. (Clinton.)

Closely allied to *C. nymphæacea*, C. & E., but readily distinguished even by the naked eye, by its *scattered* tufts of hyphæ.

22. *CERCOSPORA NYMPHÆACEA*, C. & E. Grev. VI. p. 89. N. A. F., No. 50.

Epiphyllous, on pale, suborbicular spots ($\frac{1}{4}$ — $\frac{1}{2}$ cm.) with a narrow, slightly raised, reddish brown border. Hyphæ slender and nearly hyaline, collected in minute tufts so thickly scattered over the surface of the spots as to appear evenly effused. Conidia very slender, almost thread-like, multiseptate, hyaline (yellowish in the dry specimens) straight or curved 60—90 μ long. The fungus to the naked eye is lead colored. In the dry specimens the spots are concave above and convex below.

On leaves of *Nymphæa odorata*, Newfield, N. J.

23. *CERCOSPORA RUBELLA*, Cke. Grev. VII. p. 34. Rav. F. Amer. 289.

Hyphæ epiphyllous (amphigenous?) subfasciculate, brown, on rusty red spots and areas of the leaves, bounded by a narrow, raised border. Conidia cylindrical, attenuated above, hyaline, 1—2 septate, 30—50 μ long.

On leaves of *Eriogonum tomentosum*, S. Carolina (Ravenel.)

24. *CERCOSPORA CEPHALANTHI*, E. & K. Bull. Torr. Bot. Club, XI. p. 121.

On orbicular (1—4 mm.) red-brown spots with narrow, dark, raised border. Hyphæ mostly epiphyllous, tufted, brown, continuous or faintly septate, 24—30 x 3—4 μ , at length elongated (40—56 μ) and crooked or

undulate above. Conidia (mature?) subfuscous, oblong-cylindric, 20—30 x 3—4 μ , 1—3 septate.

The tufts of hyphæ are very minute and meager, and are seen with difficulty. The conidia are not abundant.

On leaves of *Cephalanthus occidentalis*, Kansas (Kellerman).

25. CERCOSPORA GYMNOCLADI, E. & K. 1. c.

Mostly epiphyllous on suborbicular, grayish brown spots (3—4 mm.) with a discolored border. Hyphæ in minute punctiform tufts, simple, continuous, brown, 18—25 x 4 μ . Conidia obclavate-cylindric, brown, 3—6 septate, 45—60 x 5—6 μ , but often much shorter (25—35 μ), 2-3-septate and occasionally constricted at the septa.

On leaves of *Gymnocladus Canadensis*, Kansas (Kellerman).

26. CERCOSPORA OMPHAKODES, Ell. & Hol. Jour. of Mycol. I. p. 5.

Amphigenous but more abundant below, on round (5—6 μ) brown spots which are mostly included in pale-brown dead areas of the leaf. Hyphæ brown, continuous or faintly septate, abruptly bent, subgeniculate and imperfectly dentate above, 60—75 x 3 μ ; conidia brownish, cylindrical, mostly about 50—60 x 3—3½ μ , faintly 5—6 septate.

On leaves of *Phlox divaricata*, var. *Laphamii*. Aug. Iowa (Holway).

The specific name alludes to the tardy maturing of the conidia which remain for some time granular and faintly 1—2-septate.

27. CERCOSPORA CIRCUMSCISSA, Sacc., Fungi Ven., nov, V. p. 189. *C. graphioides*, Ell. N. A. F. 646.

Spots round, rusty brown (3—4 mm.) becoming pallid, with a definite concolorous margin surrounded mostly with a red shaded border. Hyphæ amphigenous but mostly hypophyllous, in slender, erect, black, bristle-like fascicles scattered over the surface of the spots, subnodulose and subflexuous above (50—75 x 3 μ) dark brown, continuous or faintly septate and united below in a black tubercular base. Conidia obclavate, 50—75 x 3½—4 μ , mostly about 3-septate, black-brown.

On leaves of *Prunus serotina*, Newfield, N. J. Autumn.

It is not absolutely certain that *C. circumscissa*, Sacc., and *C. graphioides*, Ell., are the same, but the probability of their identity is so strong that, for the present at least, we leave the latter as a synonym.

28. CERCOSPORA CONCENTRICA, C. & E., Grev. V. p. 90. *C. Yuccæ*, Ck. Grev. VII. p. 35. Rav. F. Am., no. 290.

Spots large, round or elliptical, ferrugineous, brown becoming gray. Tufts erumpent in subcircinating, tubercular pustules which have been found to be the perithecia of a *Sphæria* having biseriate, fusoid, hyaline. 1—2 septate, sporidia 12—15 x 2—2½ μ . allied to *Diaporthe gloriosa*, S. & S. The hyphæ of the *Cercospora* spring directly from these perithecia and are short (12—20 x 4 μ), brown, simple, and continuous, bearing conidia at first hyaline and cylindrical but at length quite distinctly reddish brown, attenuated above 1—5 septate, and 40—70 x 3—4 μ .

On living leaves of *Yucca filamentosa*, Newfield, N. J. *C. Yuccæ*, on *Y. gloriosa*, Ga. (Ravenel.)

Having carefully examined and compared the original specimens, we consider the two species above cited as specifically the same. The specimens of *C. Yuccæ* have the spots rusty brown, which is also true of *C. concentrica* in the young state. We find the hyphæ in both short.

29. CERCOSPORA HETEROMELES, Hark. Bull. Cal. Acad. Sci., Feb. 1884, p. 38.

Hypophyllous, on reddish brown, suborbicular, definitely limited spots ($\frac{1}{4}$ — $\frac{3}{4}$ cm.) with a narrow, raised border; hyphæ very short, brown, arising from a broad (60–80 μ), black, tubercular base; conidia subcylindrical, attenuate above, brown, 5–13 septate, 100–130 x 6 μ . Sometimes the spots are confluent over large areas of the leaf; they are also mostly of a lighter color above (grayish), and often with a dull white spot included in the brown.

On leaves of *Heteromeles arbutifolia*, Berkley, Cal. Sept. (Harkness.)

30. CERCOSPORA POLYGONACEA, E. & E. N. A. F. 1254.

On dark brown spots (2–3 mm.) with a slightly raised, narrow border, around which the leaf is often of a rusty brown, or the whole of the leaf or that part of it including the spots becoming rusty brown and dead. Hyphæ mostly epiphyllous, 80–112 x 4 μ , brown, faintly septate, subgeniculate and imperfectly incise-toothed above. Conidia linear-obclavate, hyaline, rather faintly multiseptate, mostly 80–100 μ long, but exceptionally reaching twice that length.

On leaves of *Polygonum Convolvulus*, Newfield, N. J. Aug. Quite distinct from *C. Polygonorum*, Cke.

31. CERCOSPORA PENTSTEMONIS, E. & K. Bull. Tor. Bot. club, XI, p. 121.

Amphigenous, on orbicular (.25–.5 cm.), purplish brown spots (whitening out), with a narrow, raised border surrounded by a purplish discoloration; hyphæ brown, continuous, nearly straight, subattenuated and more or less denticulate above, 25–35 x 3 μ , forming dark tufts 70 x 80 μ across, and thickly scattered over the spots, Conidia brownish, swollen or enlarged above, 2–2.5 μ thick, and, with the slender filiform base, 40–75 μ long, nucleate, becoming faintly 1–3 septate. The slender base of the conidia is abnormal and may result from imperfect development. The same was observed in *C. oculata*, and *C. tuberosa*.

On *Pentstemon cobæa* the hyphæ are more robust and as well as the conidia darker than on *P. grandiflora*.

32. CERCOSPORA ILICIS, Ell. Bull. Tor. Bot. Club, VIII, p. 65.

Seated on small (2–3 mm.) brown spots which are limited by a narrow, raised border. Hyphæ amphigenous, tufted, septate, subnodulose, 50 x 70 μ long. Conidia terminal, obclavate-cylindrical, hyaline, nucleate and at length 1–3 septate, 35–50 μ long.

On living leaves of *Ilex glabra*, Newfield, N. J., July.

HETEROECISMAL UREDINEÆ.

BY WM. TRELEASE.

Of late years, most mycologists who have paid any attention to the rust-fungi have had more or less to say about the connection of æcidial forms on the one hand, with teleutosporic forms on the other; and cultures have been tried by experimenters of all grades of skill, with a view to connecting isolated forms of both sorts. As a result, the botanical literature of the last decade or two is filled with notices on the subject, ranging from speculations based on the simultaneous occurrence of two forms, to evidence accumulated in an experimental way by such men as De Bary, Cornu and Magnus.

Since Deslangchamps suggested, in 1862, that *Gymnosporangium fuscum* might be genetically connected with *Roestelia cancellata*, Oersted, Cornu, and Magnus have instituted cultures the published results of which show that species of these genera are in reality alternating generations complementary one to the other; yet it should be noted that in this country, where they reach their largest numbers, cultures by Farlow have given only negative or contradictory results, while Rathay has had no better success in Europe.

The experiments of Scholer on *Aecidium berberidis*, in the early part of the century, and the later and better ones by De Bary, Cornu, Schroeter, and many others, have apparently proved that a number of species of *Puccinia* and *Uromyces* are connected with æcidia (often scarcely distinguishable themselves) living on other host-plants, whose only connection with those bearing the teleutospores is cohabitation. Still the number of unconnected æcidial and teleutosporic forms is now large—a fact especially true of America, where cultures have not been resorted to; and even in Europe it is doubtful whether anything is gained by attempts to classify the species with reference to their life-history.

One of the latest papers on heteroecism is by Rostrup (*Revue mycologique*, October, 1884), and contains a number of statements which will interest American students. *Puccinia suaveolens*, the fragrant rust of the Canada thistle, is joined to the heteroecismal species, although its alternating generations occur on different plants of the same host. *Puccinia phragmitis*, a rust common on the reed, and morphologically easy of recognition, seems far from being one of the simplest, since Nielsen and Rostrup claim, as the result of cultures, that its æcidium

occurs on *Rumex* and *Rheum*, while *Cornu* produced an *æcidium* on *Ranunculus repens* as the result of infection with its teleutospores; so that a strict application of the logic of heteroecism must necessitate the recognition of two species in place of one. Another curious thing about the reed-rusts is, that *Puccinia magnusiana*, a species morphologically different from the last, also produces cluster-cups on *Rumex* and *Rheum*, which cannot be readily separated from those of *P. phragmitis*, when taken by themselves.

Caeoma, a genus usually placed with the isolated ure-do and *æcidial* forms, is said by Rostrup to be, at least in part, the *æcidial* stage of *Melampsora*, which has heretofore been supposed to have no *æcidium*, if we except the sub-genus *Calyptospora*. *C. euonymi*, *C. ribesii*, and *C. mercurialis* are respectively connected with *M. caprearum*, *M. hartigii* (in part), and *M. tremulæ*, as the result of experiments; while a species similar to, if not identical with, the last named, is said to cause the development of *Cæoma pinitorquum* when sown on pines—a fact which, if true, renders intelligible the greater abundance of the *Cæoma* in the vicinity of aspens, as observed in Jutland.

As now understood, the truly heteroecismal species are brought together in the following list:

TELEUTOSPORIC FORMS.	ÆCIDIA.
<i>Chrysomyxa ledi</i> , (A. & S.).....	<i>Æcidium abietinum</i> , A. & S.
“ <i>rhododendri</i>	“
<i>Coleosporium senecionis</i> (P.).....	<i>Peridermium pini</i> (Willd.)
<i>Gymnosporangium clavariæforme</i> (Jacq.).....	{ <i>Ræstelia lacerata</i> (Sow.)
“	“ <i>penicillata</i> (Sow.)
<i>Gymnosporangium juniperinum</i> (L.)	“ <i>cornuta</i> , Gmel.
“ <i>sabinæ</i> (Dicke.)..	“ <i>cancellata</i> , Rebert.
<i>Melampsora caprearum</i> , DC.....	<i>Cæoma euonymi</i> .
“ <i>gœppertiana</i> (Kuehn.)..	<i>Æcidium columnare</i> , A. & S.
“ <i>hartigii</i> , Thuem.....	<i>Cæoma ribesii</i> , Lk.
“ <i>tremulæ</i> , Tul.....	{ “ <i>pinitorquum</i> , A. Br.?
	“ <i>mercurialis</i> .
<i>Puccinia arundinacea</i> , DC.....	<i>Æcidium ranunculacearum</i> , auct.
“ <i>caricis</i> , (Schum.).....	“ <i>urticæ</i> , Schum.
“ <i>coronata</i> , Cda.....	“ <i>ramni</i> , Gmel.
“ <i>dioicæ</i> , Magn.....	“ <i>jacobææ</i> , Grev.
“ <i>eriphori</i> , Thuem.....	“ <i>cinerariæ</i> , Rostr.
“ <i>graminis</i> , P.....	“ <i>berberidis</i> , Gmel.
“ <i>limosæ</i> , Magn.....	<i>Cæoma lysimachiæ</i> , Schl.
“ <i>magnusiana</i> , Koern.....	<i>Æcidium rubellum</i> , Gmel.
“ <i>moliniæ</i> , Tul.....	“ <i>orchidearum</i> , Desm.
“ <i>phragmitis</i> , Schum.....	“ <i>rubellum</i> , Gmel.
“ <i>poarum</i> , Niels.....	“ <i>tussilaginis</i> , Gmel.
“ <i>rubigo vera</i> (DC.).....	“ <i>asperifolii</i> , P.
“ <i>sesleriæ</i> , Reich.....	“ <i>ramni</i> , Gmel.
“ <i>sessilis</i> , Schn.....	“ <i>alli ursini</i> , P.
“ <i>silvatica</i> , Schr.....	“ <i>taraxaci</i> , Schm. & Kze.
<i>Uromyces dactylidis</i> , Oth.....	“ <i>ranunculacearum</i> , auct.
“ <i>junci</i> (Desm.).....	“ <i>zonale</i> , Duby.
“ <i>pisi</i> (Pers.).....	“ <i>euphorbiæ</i> , Gmel.
“ <i>poæ</i> , Rabh.....	“ <i>ficariæ</i> , P.

NEW LITERATURE.

BY W. A. KELLERMAN.

ELLIS, J. B. & KELLERMAN, W. A.—“Kansas Fungi;” in Bulletin of the Torrey Botanical Club, XI. p.121, continued from page 116.

The descriptions of the following new species are given: *Cercospora Apocyni*, E. & K., on leaves of *Apocynum*; *Cercospora Desmodii*, E. & K., on *D. acuminatum*; *Cercospora Cephalanthi*, E. & K., on *C. occidentalis*; *Cercospora Gymnocladi*, E. & K., on leaves of *G. Canadensis*; *Cercospora Pentstemonis*, E. & K., on *P. cobæa* and *P. grandiflora*; *Cercospora murina*, E. & K., on *Viola cucullata*; *Cercospora velutina*, E. & K., on leaves of *Baptisia*; *Ramularia Grindeliæ*, E. & K., on leaves of *G. squarrosa*; *Sphærella decidua*, E. & K., on leaves of *Vernonia Baldwinii* and *Scrophularia nodosa*; *Sphærella cercidicola*, E. & K., on fallen leaves of *Cercis Canadensis*; and *Sphærella Lactuæ*, E. & K., on living leaves of *Lactuca Canadensis*.

ARTHUR, J. C. “Hollyhock disease and the cotton plant;” in Science, Jan. 2, 1885.

The occurrence of *Puccinia Malvacearum*, Mont. in Europe is mentioned, noted as a bane to gardens, occurring on many malvaceous plants, twenty-four species as given by Dr. Winter. As to its history Mr. Arthur says: “The disease was introduced into Europe from Chili in 1869, appearing first in Spain. In four years it had spread through France and the southern portions of Germany and England, reaching northern Germany in 1874, and Ireland in 1875. It has also appeared in Australia and the Cape of Good Hope, but it has not yet, in all probability, invaded North America. The plant reported under this name from California is doubtless another species as I am informed by Dr. Farlow who has examined the Californian specimens, although not those of the original collector. The mention by Burrill of its introduction into this country is an error, as I have learned from the author. A disease sometimes spoken of in American journals under this name is due to an entirely different cause.” Mr. Plowright investigated, at the suggestion of Mr. Arthur, the liability of the cotton plant becoming infected with this rust. The experiments carried on in England gave negative results, the cotton plant in no case becoming infected.

ELLIS, J. B., & MARTIN, GEO.—“New Species of North American Fungi;” in American Naturalist, Nov. and Dec., 1884.

The following species, collected at Cool Springs, Fla., by Dr. Geo. Martin, are described: *Exobasidium Symploci*, E. & M., on distorted flower buds of *Symplocos tinctoria*; *Dermatea Sabalidis*, E. & M., on dead petioles of *Sabal serrulata*; *Asterina subcyanea*, E. & M., on living leaves of *Quercus laurifolia*; *Asterina discordea*, E. & M., on living leaves of *Quercus laurifolia*; *Asterina lepidigena*, E. & M., attached to the epidermal scales on living leaves of *Andromeda ferruginea*; *Asterina*

pustulata, E. & M., on leaves of *Quercus laurifolia*; *Ascomycetella floridana*, E. & M., on leaves of *Quercus laurifolia*; *Phyllosticta leucothoes*, E. & M., on leaves of *Leucothoe acuminata*; *Phyllosticta sinuosa*, E. & M., on leaves of *Olea Americana*; *Phyllosticta corylina*, E. & M., on leaves of *Corylus Americana*; *Phyllosticta Apocyni*, E. & M., on leaves of *Apocynum cannabinum*; and *Sacidium Polygonati*, E. & M.; on dead stems of *Polygonatum giganteum*.

CRAGIN, F. W.—“First contribution to the Catalogue of the Hymenomyces and Gasteromyces of Kansas;” in Bulletin of the Washburn Laboratory of Natural History, Vol. 1, No. 1.

In this paper are given the names and localities of 136 determined species, belonging to genera as follows: *Agaricus* 22, *Coprinus* 2, *Hygrophorus* 2, *Lactarius* 1, *Russula* 1, *Marasmius* 3, *Lentinus* 1, *Panus* 2, *Schizophyllum* 1, *Lenzites* 1, *Boletus* 1, *Polyporus* 39, *Trametes* 5, *Dædalia* 6, *Favolus* 1, *Merulius* 4, *Hydnum* 5, *Mucronella* 1, *Irpex* 6, *Radulum* 1, *Thelephora* 1, *Stereum* 15, *Corticium* 9, *Solenia* 1, *Cyphella* 1, *Calocera* 1, *Tremella* 2, *Exidia* 1, and *Hirneola* 1 species.

Those proposed as new are as follows :

AGARICUS ALVEOLATUS, Cragin.—Pileus convex, about an inch across, salmon-red; stipe and gills concolorous; surface of pileus raised into a net-work of ridges or walls, so as to give it a *pitted* appearance; stipe short and thick, the total height of the specimen being about equal to the breadth of the pileus; spores rose white, better described, perhaps, as a delicate salmon-pink. Belongs to the series *Hyporhodii*.

TRAMETES KANSENSIS, Cragin.—Pileus dimidiate, sessile, pitted so as to appear granulate, tumulous, normally once or twice sulcate near the acute margin; from nearly brown on the margin, becoming grayish and then blackish toward the centre; interiorly light chestnut-brown. Hymenial surface fulvous (pallid-fulvous or rufo-fulvous), more or less convex, with a smooth (almost unctuous) feel, easily receiving and retaining the impression of the finger-nail. Pores long, unequal, entire, multiform, largely subrotund, many arcuate, a few even sinuate, obtuse, for the most part rather distant, lined with whitish or grayish-brown. Trama of the pores becoming ferrugineous yellow in a superficial zone, about one-fifteenth to one-twentieth of an inch in thickness in which zone the lining of the pores becomes lighter.

Dædalia ambigua, Berk., var. *CORONATA*, Cragin.—A specimen of *Dædalia*, taken near Topeka in autumn, agrees well with *ambigua* in texture, color and pores, but differs so remarkably in *form* from any known phase of that species that it seems worthy of distinction, at least as a variety. It has the pileus dimidiate, higher than long, its margin pinched off from the remainder by a deep groove, and separated into four large, broadly rounded, sub-erect, symmetrical lobes, which are well parted at the base, but contiguous above, giving them a pileoloid appearance. The central surface of the pileus is much elevated and evenly rounded.

DÆDALIA TORTUOSA, Cragin.—Pilei dimidiate, convex, often imbri-

cated and confluent, between corky and woody, strigose-roughened, pale yellowish brown, becoming smoother and paler, internally concolorous, zonate, one-twelfth to one-eighth of an inch thick, usually once or twice sulcate near the acute, minutely repand, ferrugineous brown margin, (which is sometimes concolorous.) Hymenium pale cinnamon-brown, generally effused at the base and abruptly sub-porous at the margin. Sinuses labyrinthiform, flexuose, intricate, torn and toothed; very similar to those of *D. unicolor*, Fr., except in color and much larger size.

ELLIS, J. B. & EVERHART, B. M.—“New Species of Fungi from Washington Territory”; in the Bulletin of the Washburn Laboratory of Natural History, Vol. I., No. 1.

These were collected by W. N. Saksdorf during the summer and fall of 1883. The species are as follows: *Puccinia asperior*, E. & E. æcidium and teleutospores, on *Ferula dissoluta*; *Puccinia Angelicæ*, E. & E., uredo and teleutospores; *Æcidium Collinsiæ*, E. & E., on leaves, flower-bracts, and calyx of *Collinsia parviflora*; *Patellaria signata*, E. & E., on dead bark and wood of *Tsuga Pattoniana*; *Leptosphaeria hysteroioides*, E. & E., on dead leaves of *Xerophyllum tenax*; *Pleospora ampli-spora*, E. & E., on dead stems of *Lupinus*; *Lasiosphaeria stuppea*, E. & E., on dead limb of *Tsuga Pattoniana*; *Anthostomella brachystoma*, E. & E., on rotten wood of *Tsuga Pattoniana*; *Ceratostoma tinctum*, E. & E., on dead wood of *Acer macrophyllum*; *Teichospora muricata*, E. & E., on the bark of same tree; *Comatricha Saksdorfi*, E. & E., on a trunk of *Pinus albicaulis*; *Lamproderma robusta*, E. & E., on woody branches of *Aplopappus Bloomeri*; *Phoma Lupini*, E. & E., on living leaves of *Lupine* (?); *Hendersonia diploidoides*, E. & E., on bark of *Sambucus glauca*; *Hendersonia cylindrocarpa*, E. & E., on dead scape of *Brodiaea Howellii*; and *Excipula conglutinata*, E. & E., on dead stems of *Valeriana capitata*.

HARKNESS, H. W.—“New Species of California Fungi;” in Bulletin of the California Academy of Sciences, No. 1, Feb. 1884.

Dr. Harkness here describes seventy-one species and proposes four new genera each including one species, as follows:

CAMPOSPORIUM, Hk.

(*Etym.* *Campe*: larva, from the resemblance of the spore to the larva of *Danaïs Archippus*.)

Hypha brown, flexuous, septate. Spores 1—2, attached by slender pedicels to the angles of the apex, transversely pluriseptate with filiform setæ springing from the apex.

CAMPOSPORIUM ANTENNATUM, Hk.

Hyphæ septate, flexuous, brown; spores 1—2, cylindrical, pale olive brown, 7—13 septate, attached to the apical angles of the hyphæ by filiform spiral pedicels; ultimate cells hyaline, the upper one bearing two, sometimes one or three, filiform setæ $\frac{1}{3}$ — $\frac{1}{2}$ as long as the spore, 70—94 x 10 μ . On decaying bark of *Eucalyptus globulus*, December.

TROPOSPORIUM, Hk.

Sporodochium flattened, farinaceous. Hyphæ elongated, lax, branching. Spores spiral, attached to the hyphæ by slender, pedicel-like branchlets. Allied to Fusisporium, but with very different spores.

TROPOSPORIUM ALBUM, Hk.

Acervuli white, 1—2 mm., often confluent, thick, branching freely, without septa, containing numerous granules and oil globules which are set free by breaking; spore—a long tube, granular, nucleolate, without septa, 7 μ wide, coiled in a long spiral of 3—7 turns, flattened at the crossings, forming an oblong mass, with crenate borders 40—45 x 12—22 μ .

On dead stems of *Corylus rostrata*. December.

THECLOSPORA, Hk.

Spores surrounded by a cleft, hyaline border, borne on slender, branching hyphæ, compacted into a globular, woody mass.

THECLOSPORA BIFIDA, Hk.

Heaps scattered, globular, 1—2 mm. in diameter, loosely attached to the surface, white, becoming yellow; hyphæ arising from irregular, yellowish, elongated masses, rough, slender, bearing at intervals granular spores, surrounded by a broad and firm hyaline or yellowish border, marked with concentric striæ, and cleft on opposite sides, the hypha apparently passing through, 24—40 μ .

On rotting leaves of *Eucalyptus globulus*, December.

The place of this fungus in classification is very uncertain, and it is only placed here because of its connection with the next.

CLEISTOSOMA, Hk.

Perithecia orbicular, membranous. Asci borne on branching threads, globose, evanescent. Sporidia hemispherical, echinulate.

CLEISTOSOMA PURPUREUM, Hk.

Perithecia purple black, very delicate, soon dehiscent, developed within the heaps of *Cleistosoma purpureum*, which it stains purple; asci globular, hyaline, 8-spored, 9—12 μ ; sporidia purple, hemispherical, long echinulate around the disk margin, 3—4 μ .

BURRILL, T. J. "New Species of Uredineæ;" in *Botanical Gazette*, Dec. 1884.

The species described are from large collections of Illinois fungi made mostly by Mr. A. B. Seymour for the State Laboratory of Natural History. Mr. Seymour is author of the last three species named in the list; *Uromyces Cnotheræ*, Burrill, I, II, and III, on *C. linifolia*; *Uromyces Scirpi*, Burrill, II and III, on *S. fluviatilis*; *Uromyces graminicola*, Burrill, on *Panicum virgatum* and *Elymus Virginicus*; *Puccinia tenuis*, Burrill, I (*Æcidium tenue*, Schw.) and III, on leaves of *Eupatorium ageratoides*; *Puccinia Seymeriæ*, Burrill, III, on *S. macrophylla*; *Melampsora Crotonis* (Cooke), II and III, (*Trichobasis Crotonis*, Cooke) on leaves of *Croton capitatum*, *C. monanthogynus*, and *Crotonopsis line-*

aris; *Æcidium Dicentrae*, Burrill, on *D. Cucullaria*; *Æcidium Onobrychidis*, Burrill, on *Psoralea Onobrychis*; *Æcidium Diodiæ*, Burrill, on *D. teres*; *Æcidium Myosotidis*, Burrill, on *M. verna*; *Æcidium Physalidis*, Burrill, on *P. viscosa*; *Æcidium Crotonopsidis*, Burrill, on *C. linearis*; *Æcidium Trillii*, Burrill, on *T. recurvatum*; *Puccinia Ranunculi*, Seymour, III, on *R. repens*; *Puccinia Conoclinii*, Seymour, II and III, on leaves of *C. cœlestinum*. ("This is *P. Centaureæ*, DC. of Berkley's Notices of North American Fungi, Grev. III., p. 53, as ascertained by examination of the original specimen in Herb. Curtis, but it differs from authentic specimens bearing this name in various exsiccati," l. c. p. 191). and *Æcidium Cephalanthi*, Seymour.

ELLIS, J. B., & HARKNESS, H. W.—"New Californian Fungi," in Bulletin of the California Academy of Sciences, No. 1, Feb. 1884.

The following species are described: *Puccinia congregata*, E. & Hk., hymenium and stylospores unknown, teleutospores on living leaves of *Heuchera micrantha*; *Puccinia digitata*, E. & Hk., teleutospores only known, on living leaves of *Rhamnus crocea*; *Puccinia melanconoides*, E. & Hk., stylospores unknown, hymenium and teleutospores on the upper surface of living leaves of *Dodecatheon Meadia*; *Puccinia nodosa*, E. & Hk., teleutospores only known, on living leaves of *Brodiaea capitata*; *Uromyces Brodiaeae*, E. & Hk., hymenium (*Æcidium Brodiaeae*, E. & Hk.) stylospores uncertain, teleutospores on living leaves of *Brodiaea laxa*; *Uromyces Chorizanthi*, E. & Hk., hymenium unknown, stylospores and teleutospores, on stems of *Chorizanthe pungens*; *Uromyces Eriogoni*, E. & Hk., hymenium, stylospores and teleutospores, on stems of *Eriogonum virgatum*; and *Hymenula aciculosa*, E. & Hk., on leaves of *Pinus ponderosa*.

PHILLIPS, WILLIAM, & HARKNESS, H. W.—"Fungi of California;" in Bulletin of the California Academy of Sciences, No. 1, Feb., 1884.

Contains descriptions of eight new species of *Peziza*, two of *Calloria*, one of *Belonidium*, two of *Phillipsiella*, and one each of *Helotium*, *Boudiera*, *Patellaria*, *Midotis*, *Stictis*, *Triblidium*, *Hysterium* and *Ailographum*.

LOWRIGHT, C. B., & HARKNESS, H. W.—"New Species of California Fungi;" in Bulletin of the Academy of Sciences, No. 1, Feb. 1884.

Nectria Galii, Pl. & Hk., and *N. umbellulariæ*, Pl. & Hk., are described.

GYMNOSPORIUM HARKNESSIOIDES, Ell. & Hol.

(*Journal of Mycology*, No. 1, p. 6.)

Mr. Holway sends the following additional note:

"I found these spores very abundant on leaves of nearly every plant in the grove where I first discovered it. No immature stage could be found. It often occurred on every leaf of a tall *Lophanthus*, where it would seem impossible for a fungus to discharge its spores. They are much like the spores of some *Sordaria*, but the most careful search failed to find any such origin for it."

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[CONTINUED FROM PAGE 24.]

ENUMERATION OF THE NORTH AMERICAN CERCOSPORÆ.

WITH DESCRIPTIONS OF THE SPECIES.

BY J. B. ELLIS AND BENJAMIN M. EVERHART.

33. *CERCOSPORA SMILACIS*, Thuem. Hedwigia, 1880, p. 35. 33d Rep. N. Y. State Mus., p. 29 (with figures.) N. A. F. 1251. Rav. Fungi Amer. 166, 616.

Spots numerous, small, orbicular, reddish-brown, surrounded by a darker, raised margin. Hyphæ hypophyllous, tufted, slender, septate, nodulose above, colored. Conidia narrow-clavate, 30—60 μ long, hyaline. 2—4 septate.

On living leaves of various species of *Smilax* from N. Y. (Pk.) to Florida (Dr. Martin.) Distributed in F. Am. cited above, as *Helminthosporium Petersii*, B. & C., but the specimens do not agree well with the description in Grev. III, p. 102, nor with specimens of that species in Herb. Curtis.

34. *CERCOSPORA RHUINA*, C. & E. Grev. VI, p. 89. N. A. F. 47.

Mostly hypophyllous. Hyphæ olive brown, 40—60 x 3 μ ; nucleate but mostly without septa, collected in little tufts or fascicles on reddish brown (2—4 mm.) spots with a narrow, raised margin. Conidia cylindrical at first, finally attenuated above, nearly hyaline, nucleate, sparingly and faintly septate, 40—70 x 3 μ .

On leaves of *Rhus copallina* and *R. glabra*, from New Jersey to Kansas. Common.

Cercospora copallina, Cke., Grev. XII, p. 31. Rav. Fungi Amer. 586, is said to be "quite different," but it is not stated in what the difference consists. As far as we can see, the specimen in F. Am. 586 does not differ in any way from the N. A. F. specimens. There are the same olive brown tufted hyphæ in both. The spots and conidia also appear to be the same.

35. *CERCOSPORA DEPAZEOIDES* (Desm.) Sacc. Fungi Ven. nov. vel. crit. V, p. 187. *Exosporium depazeoides*, Desm. *Passalora penicillata*, Ces. *Cercospora sambucina*, E. & K., Am. Nat., Nov. '83, p. 1166.

On small suborbicular, reddish-brown spots (2—3 mm.) with a narrow, raised border. Hyphæ densely cæspitose, epiphyllous, brown, flexuous, 100—150 x 3—4 μ , mostly continuous. Conidia cylindric-clavate, curved, 3—7 septate, 55—75 x 3—4 μ .

On leaves of *Sambucus Canadensis*, Kansas (Kellerman), New York (Peck.)

36. *CERCOSPORA MORICOLA*, Cke. Grev. XII, p. 30. Rav. Fungi Amer. 587.

Hyphæ fasciculate, short, olive-brown, hypophyllous, on round, reddish brown, (3—4 mm.) spots, surrounded by a pale, reddish discoloration. Conidia attenuated above, 3—4 septate, hyaline, 70 x 3 μ .

On leaves of *Morus rubra*, South Carolina (Ravenel), Kansas (Kellerman.)

37. *CERCOSPORA PURPUREA*, Cke. Grev. VII, p. 34. Rav. F. Am. 190. *C. Perseæ*, E. & M., Am. Nat., Feb. '84, p. 189.

Hyphæ epiphyllous, densely erumpent-cæspitose, dark brown, faintly septate, subdenticulate above, 50—70 x 4—6 μ , on round or irregular reddish brown definite spots ($\frac{1}{4}$ —1 cm.) Conidia obclavate-cylindrical, 40—100 x 6—8 μ , septate, nearly hyaline.

On leaves of *Persea palustris*, Ga. (Ravenel), Fla. (Martin.)

38. *CERCOSPORA HEUCHERÆ*, E. & M. Am. Nat., Feb. '84, p. 189.

Spots brown, mostly round (4—5 mm.), border obsolete. Hyphæ fasciculate, flexuous, light brown, mostly hypophyllous, 30—35 x 3—4 $\frac{1}{2}$ μ . Conidia subhyaline (light straw color), cylindric-obclavate, septate, 60—70 x 3 μ .

On leaves of *Heuchera Americana*, Penn. (Dr. Martin.)

39. *CERCOSPORA XANTHOXYLI*, Cke. Grev. XII, p. 30. Rav. Fungi Amer. 780.

Hyphæ epiphyllous, short, 10—12 x 4 μ , brown, on pale brown, definite spots, (5—10 mm.) Conidia obclavate-cylindrical, 1—3 septate, hyaline, 25—38 x 3—4 μ .

On leaves of *Xanthoxylon Carolinense*, Ga. (Ravenel.)

40. *CERCOSPORA DEMETRIONIANA*, Winter, Rab.-Winter Fungi Eur. 3079.

Spots large ($\frac{1}{4}$ cm.) round, sometimes confluent, dirty-brown above,

grayish below, generally concentrically zoned, not very definitely limited. Tufts of hyphæ minute, amphigenous, scattered. Hyphæ fasciculate, not at all or only slightly torulose sparingly and remotely septate, fuscous, generally $110-130\ \mu$ long, $5-6\ \mu$ thick but sometimes elongated to 1 mm. long. Conidia filiform, subclavate, *i. e.* gradually attenuated upwards from the slightly thickened base, hyaline, multiseptate, brownish, reaching even $170\ \mu$ long, $5-5\frac{1}{2}\ \mu$ thick.

On *Crotalaria sagittalis*, Missouri (Demetrius.)

41 CERCOSPORA DIODEÆ, Cke. Grev. VII, p. 34. Rav. F. Am. 293.

Hyphæ epiphyllous, fasciculate, septate, fuscous, on round, determinate, rusty brown spots, (2—3 mm.) Conidia cylindrical, slender, hyaline, $50 \times 3\ \mu$.

On leaves of *Diodia teres*, S. Carolina (Ravenel.)

42. CERCOSPORA ROSÆCOLA, Pass. in Thuem. M. U. no. 333. Sacc. Myc. Ven. 1249. N. A. F. 1255.

Spots round, gray-brown ($1\frac{1}{2}$ —2 mm.) border dark brown. Hyphæ amphigenous (mostly epiphyllous), dark, subcontinuous, subnodulose above, $20-50 \times 4-4\frac{1}{2}\ \mu$, collected into small, dense, hemispherical tufts. Conidia cylindrical, slightly attenuated above, nearly straight, 3—5 septate, $30-60 \times 3\frac{1}{2}-4\ \mu$.

On leaves of roses.

43. CERCOSPORA MICROSORA, Sacc. Mich. II, p. 128. *Cercospora Tilia*, Pk. Bot. Gaz. VI, p. 277.

"Spots small, numerous, suborbicular, brown with a paler center. Hyphæ tufted, hypophyllous, minute. Conidia bacillary, brownish or cinereous, 3—5 septate, $25-40 \times 3\frac{1}{2}-4\ \mu$. The center of the spots on the upper surface is sometimes tinged with reddish brown, on the lower surface with cinereous."

On living leaves of *Tilia Americana*, June, Vermont (Pringle.)

We have seen no specimens of Prof. Peck's species, but the characters quoted above agree so well with the description of *C. microsora*, Sacc., and with the specimens in Fungi Gallici 2032, and Rab.-Winter F. E. 2781, that there can be little doubt of its being this species.

44. CERCOSPORA MAGNOLIÆ, Ell. & Hark. Bull. Tor. Bot. Club, VIII, p. 27. N. A. F. 643.

Spots suborbicular, minute, less in size than the head of a pin, visible on both sides of the leaf and surrounded by a dark, raised border. Hyphæ fasciculate, erect, septate, nearly black, $25-40\ \mu$ high. Conidia obclavate, 3—5 septate, $20-40\ \mu$ long. Only 3 or 4 tufts of hyphæ grow on each spot.

On living leaves of *Magnolia glauca*, Newfield, N. J.

45. CERCOSPORA EUPATORII, Pk. 33d Rep. N. Y. State Mus. p. 29.

"Spots at first small and pale green, then larger, suborbicular, determinate, reddish-gray or reddish-brown, with an elevated margin and

darker border. Hyphæ tufted, short, simple, colored. Conidia elongated, slender, slightly thickened towards one end (below ?) obtuse, colorless. 3-septate, 50—75 μ long."

On living leaves of *Eupatorium album*, Long Island, N. Y. (Miller.)

46. CERCOSPORA FILISPORA, Pk (in herb.)

Spots orbicular or irregular, brown (3—5 mm.) with a narrow, red-brown border, amphigenous. Hyphæ nearly obsolete, consisting merely of closely compacted, elongated cells arising from the surface of little sclerotoid tubercles thickly scattered over the surface of the spots and bearing fascicles of long (125—200 x 2—2½ μ), multiseptate, yellowish, subhyaline, more or less curved conidia, which are so abundant as to give a cinereous or lead colored hue to the surface of the spots. The conidia are only slightly attenuated above.

On *Lupinus perennis*, July, N. Y. (Peck.)

47. CERCOSPORA INQUINANS, Cke. Grev. VII, p. 12.

"Amphigenous. Hyphæ fasciculate, short, dark. Conidia obclavate, robust, 1—3 septate, brown (fuliginous), 30—70 x 6 μ .

On living leaves of *Gymnocarpus*." California (Harkness.)

48. CERCOSPORA SYMPLOCARPI, Pk. De Thuem. M. U. no. 669. N. A. F. 1259.

Spots definite, suborbicular, brown, with a darker border (¼—½ cm.) Hyphæ amphigenous, short, thick, light brown, cæspitose. Conidia long. (75—125 μ) obclavate-cylindric, multiseptate, subhyaline.

On living leaves of *Symplocarpus foetidus*, July, N. Y. (Peck), Pa. (Rau.)

49. CERCOSPORA CERCIDICOLA, Ell. Am. Nat. Oct. '82, p. 810. N. A. F. 1246.

Spots when first appearing small (1 mm.) and nearly black, but soon enlarging (3—4 mm.), and becoming light gray or dull white above but remaining a rusty brown beneath, limited by a narrow, black-brown raised border which is surrounded by a zone of rusty, shaded brown. Hyphæ amphigenous, fasciculate, brown, 90—114 x 3½—4 μ , subgeniculate or subulate above. Conidia oblong-clavate, faintly 3-septate, 30—40 x 5—7 μ .

On living leaves of *Cercis Canadensis*, Ky. to Kansas (Kellerman.)

50. CERCOSPORA APII, Fres. Beitr. p. 91, figs. 46-54.

Spots amphigenous (4—6 mm.) pale brown, suborbicular with a definite, narrow, raised margin. Hyphæ mostly hypophyllous, in minute (25—30 μ) brown tufts, thickly scattered over the spots, pale brown, continuous or with 1—2 faint septa, subundulate above, 40—60 x 4—5 μ . Conidia slender, obclavate, faintly (3—10 septate), 50—80 x 4 μ . The affected leaves are at first roughened here and there with groups of minute pustules visible on both sides of the leaf. These groups soon become brownish in the center, and the brown color soon develops into the spots above described.

The above notes, which agree well with the original description and figures of Fresenius, are from specimens collected in Michigan, on cultivated celery, by Professor Beal, and communicated to us by Dr. Farlow. Specimens on celery collected in Italy by Prof. Passerini (comm. de Thuemen) appear to be the same as the Michigan specimens, except that the spots are less definite. Specimens in de Theumen's M. U., No. 483 (on *Petroselinum*), and in Rabh. Myc. Eur. 2071, on the same host, differ from the above in their much smaller, paler spots, larger and less numerous tufts of hyphæ which are darker and more distorted above, bearing oblong 1—3 septate, conidia, $30-50 \times 5-7 \mu$, without any slender prolongation above. Specimens on *Pastinaca* collected in New York by Prof. Halsted (comm. Dr. Farlow) have hyphæ and conidia scarcely distinguishable from the last mentioned species in their microscopical characters, but there are no spots, the minute, blackish tufts of hyphæ being evenly and thickly distributed over the lower surface of the leaves or occupying small, irregular areas bounded by the veinlets. In the specimens on *Pastinaca* in de Thuemen's M. U. 1169, we find no Cercospora. In specimens on *Pastinaca* from Iowa, the hyphæ are confined to small and scattered areas bounded by the veinlets of the leaf, but on these areas the tufts of hyphæ are densely crowded so as to appear effused, and are of a light cinereous hue, perhaps on account of the abundant conidia which are, the same as in the other specimens on *Pastinaca*, 1—3 septate. Specimens on *Pastinaca* sent from Wisconsin by Professor Trelease are the same as the Iowa specimens on *Pastinaca*, only the conidia are longer and more distinctly attenuated above, though only 3-septate. On the Wisconsin specimens was also a *Ramularia* with oblong-cylindrical, $10-20 \times 3 \mu$, 1-septate conidia, growing on small (2—3 mm.), definite, rusty brown spots and having the general appearance of the true *C. Apii*, Fres.

We have left for the present all the forms above noted under *C. Apii*, Fres. though strongly of the opinion that the variety on *Pastinaca* at least will yet prove specifically distinct.

c. *Spots angular or irregular.*

51. CERCOSPORA BØEHMERIÆ, Pk. 34th Rep. N. Y. State Mus., p. 48.

Spots small, numerous, often confluent, angular, limited by the veinlets, brownish, sometimes becoming arid and grayish. Hyphæ hypophyllous, tufted, short, subflexuous, colored. Conidia subcylindrical or bacillary, generally curved, 4—5-septate, colored, $40-80 \mu$ long. The spots, though numerous are not very conspicuous, on account of their very dull color; the tufts of hyphæ also are very numerous, but so minute as scarcely to be visible to the naked eye. They are compactly united at base in a sort of sclerotoid mass as in *C. venturioides*.

On leaves of *Bœhmeria cylindrica*, N. Y. (Peck.)

52. CERCOSPORA LIRIODENDRI, Ell. & Hark. Bull. Torr. Bot. Club. VIII, p. 27. N. A. F. 645.

Hypophyllous. On small (2 mm.) angular, brownish spots, mostly bounded by the veinlets of the leaf. Hyphæ fasciculate, erect, sparingly

septate, brown. Conidia oblong, uniseptate, hyaline, 20–50 μ long.

On leaves of *Liriodendron Tulipifera*, Vineland, N. J. October.

53. *CERCOSPORA LEPTOSPERMA*, Pk. 30th Rep. N. Y. St. Mus., p. 55.

Hyphæ tufted, short, hyaline, seated on pale greenish, angular, indefinite spots. Conidia colorless, very slender, subfiliform, 75 μ long, slightly thicker toward the base where there are usually 1 or 2 obscure septa.

On living leaves of *Aralia nudicaulis*, Iowa (Holway.)

54. *CERCOSPORA TUBEROSA*, E. & K. Bull. Torr. Bot. Club, XI, p. 116.

Hypophyllous, on spots (.75–.5 cm.) at first gray and imperfectly defined, but at length dirty brown and of irregular outline, angular, elongated and partly limited by the veinlets of the leaf, hyphæ arising from a small tubercular base, nearly straight and more or less toothed above, septate, brown, 35–45 x 4 μ . Conidia subcylindric, slightly tapering upwards, subfuscous, 5–10-septate, 80–110 x 3.5–4 μ .

The spots are darker and more distinctly defined on the upper side of the leaf. This differs from No. 15 chiefly in the character of the spots.

On leaves of *Apios tuberosa*, Kansas (Kellerman.)

Cercospora glaucescens, Winter, which is the same as this, was published in Rab.-Winter Fungi, about the same time that *C. tuberosa* appeared in the Bulletin, so that it is difficult to say which has precedence. Dr. Winter's specimens were from Missouri.

55. *CERCOSPORA ELONGATA*, Pk. 33d Rep. N. Y. State Mus., p. 29.

Spots irregular, angular, limited by the veinlets of the leaf, often confluent, sometimes arid, brown, grayish brown or cinereous. Hyphæ amphigenous, tufted, colored, subflexuous, sometimes nodulose. Conidia elongated, obscurely 3–many-septate, attenuated, colorless, 50–150 x 4–5 μ .

On living leaves of *Dipsacus sylvestris*, Aug., N. Y. (Peck.)

56. *CERCOSPORA ALTHÆINA*, Sacc. Mich. 1, p. 269.

Spots thickly scattered over the leaf (2–4 mm.), subangular, partly limited by the veinlets of the leaf, olivaceous, becoming grayish-brown, with a narrow, darker, slightly raised border. Hyphæ cæspitose, amphigenous, fuscous, nearly straight, scarcely septate, 40–60 x 5 μ . Conidia fusoid-cylindrical, 3–5 septate, only moderately attenuated above, hyaline. The above notes are from specimens found by Dr. Farlow on *Althæa rosea*, at Wood's Holl. Mass., and they agree so well with Saccardo's description of *C. althæina* that we think it is that species, though we have no authentic specimen for comparison.

C. malvicola, E. & M., Am. Nat., Oct. '82, p. 810, N. A. F. 821, is probably only a form of this, differing principally in its longer (80–112 μ) hyphæ and conidia (75–90 μ .)

Specimens on *Callirrhoe* (?) collected by Dr. Kellerman at Great Bend, Ks., Aug. 1884, are essentially the same as N. A. F. 821, and specimens on *Abutilon Avicennæ* from Manhattan, Ks., Sept. '84, though differing somewhat in general aspect, do not show any marked difference in their

microscopical characters. In all the specimens except those on *Abutilon*, the spots at first present a peculiar dull, greenish, water-soaked appearance which, though difficult to describe, is easily recognized when once seen.

We have thought it best, for the present at least, to refer all these forms to *C. althæina*, Sacc., though it is not absolutely certain that they belong to that species.

57. *CERCOSPORA ÆRUGINOSA*, Cke. Rav. Fungi Amer. 68.

Spots irregular, suborbicular (2—3 mm.), rather inconspicuous and indefinitely limited, brownish. Hyphæ densely fasciculate, greenish, short (35 μ). Conidia cylindrical, attenuate above, 3—5-septate, 60 x 3½ μ .

On leaves of *Rhamnus*, South Carolina.

58. *CERCOSPORA GALII*, Ell. & Hol. Jour. of Mycol., I, p. 5.

Mostly hypophyllous, on dead grayish-brown, definitely limited spots and areas of the leaves. Hyphæ simple, continuous, brown, undulate and geniculate above, 35—50 x 3—4 μ , forming dense tufts arising from a tubercular base. Conidia cylindrical, continuous (becoming septate). brownish, nucleolate, 30—40 x 3½ μ , nearly straight.

On leaves of *Galium Aparine*, July, Iowa (Holway.)

59. *CERCOSPORA VICIÆ*, Ell. & Hol. Jour. of Mycol. I, p. 5.

On light brown, purplish bordered spots and irregularly shaped, dead areas of the leaf. Hyphæ densely tufted, continuous, brown, entirely or slightly denticulate above, short (25—30 x 3—4 μ). Conidia cylindrical, granular, becoming 3-septate, 30—40 x 3—3½ μ . Differs from *C. Lupini*, Cke., and *C. Phaseolorum*, Cke., in its definitely limited spots. The former also has the hyphæ branched much as in *C. racemosa*, E. & M.

On leaves of *Vicia sativa*, Iowa (Holway.)

60. *CERCOSPORA ZEBRINA*, Pass. in Rab. F. E. 2277.

Spots elongated in the direction of the nerves of the leaf, narrow, nearly black, limited by the veinlets of the leaf. Hyphæ simple, entire, subflexuous above, smoky-brown. Conidia very long, attenuated above, multiseptate, hyaline.

On leaves of *Trifolium agrarium*, N. Y. (Peck.)

61. *CERCOSPORA GARRYÆ*, Hark. Bull. Cal. Acad. Sci., February 1884, p. 38.

"Hypophyllous; spots irregular, pale. Hyphæ pale brown, slender. Conidia nearly linear, slightly attenuated above, hyaline, 7—12-septate, 110 x 10 μ ."

On living leaves of *Garrya elliptica*, Cal. (Harkness.)

62. *CERCOSPORA CAULOPHYLLI*, Pk. 33d Rep. N. Y. State Mus., p. 30.

Spots irregular or suborbicular, dark brown or grayish, with a dark brown margin. Hyphæ hypophyllous, tufted, flexuous, nodulose above, colored, rarely branched. Conidia oblong or cylindrical, with 1—3 septa, colorless, 20—30 x 7—8 μ .

On living or languishing leaves of *Caulophyllum thalictroides*, July, N. Y. (Peck.)

63. CERCOSPORA SQUALIDULA, Pk. 33d Rep. N. Y. State Mus., p. 29.

Spots angular or suborbicular, brown or grayish brown with a dark border. Hyphæ amphigenous, tufted, slightly nodulose above, colored. Conidia cylindrical or subclavate, very unequal in length, 30—110 μ long, nearly hyaline, continuous or with 1—3 faint septa. The spots are sometimes of a uniform, dark brown color, and sometimes grayish with a darker border.

On living leaves of *Clematis Virginiana*, Aug., N. Y. (Peck), Iowa (Holway.)

This is very closely allied to *C. olivascens*, Sacc., but a careful comparison of authentic specimens from Prof. Peck with the specimens in Mycotheca Veneta 1251, shows that the tufts of hyphæ in Saccardo's specimens are of a somewhat lighter color and less compact, the hyphæ longer, rather lighter colored and more distinctly toothed and geniculate above; conidia also longer and narrower and spots more angular, limited mostly by the veinlets of the leaf. In Peck's specimens, too, the hyphæ are amphigenous. It is not improbable that this and the next No. will prove to be the same.

64. CERCOSPORA RUBIGO, Cke. & Hark. Grev. XIII, p. 17.

"Amphigenous. Spots ferruginous, elliptical and irregular. Hyphæ very short, scattered. Conidia cylindrical, straight or curved, ends obtuse, 3—4-septate, hyaline, 35—40 x 4 μ ."

On leaves of *Clematis*, Cal. (Harkness.)

CERCOSPORA ECHINOCYSTIS, E. & M. Am. Nat., Dec. '82, p. 1003.

Spots small (1—3 mm.), angular, bounded partly by the veinlets of the leaf. Hyphæ brown, fasciculate, hypophyllous, scarcely septate, 35—45 x 4 μ . Conidia clavate-cylindrical, hyaline, 3—6 septate, 80—105 x 3 μ . The spots are very abundant and leaves on which they abound soon wither. Hyphæ also occur on the upper surface of the leaves.

On living leaves of *Echinocystis lobata*, Ky. and Ohio (Kellerman.)

d. Spots indefinite.

66. CERCOSPORA GRANULIFORMIS, Ell. & Hol. Jour. of Mycol. I, p. 6.

Amphigenous, on large (1 cm.) round, indefinitely limited brown spots. Hyphæ short (15—25 x 3 μ) continuous, brown, nearly straight, obtuse and entire at first, becoming subundulate and somewhat toothed above, densely compacted into small (75 μ), sphaeriæform tufts, scattered quite thickly over the spots and resembling minute perithecia, brownish at first but at length black. Conidia cylindrical, straight, brownish, 1—3 septate, 17—85 x 2½—3 μ . Allied to *C. sphaeriæformis*, Cke., but quite different from *C. Violæ*, Sacc.

On leaves of *Viola cucullata*, July, Iowa (Holway.)

ON THE STUDY OF THE AGARICINI.

BY A. P. MORGAN.

The wonderfully increasing interest in the study of Fungi is manifest by the monthly publication in all our botanical periodicals, of discoveries of new species and observations on their habits and growth. A vast field of labor, not less extensive than that afforded by the Flowering Plants, has just been entered upon by a multitude of workers possessing every facility for exploration and observation, and favorably distributed in all parts of this great country. The promise is good that in the next decade we may present a true and accurate account of our mycologic flora in systematic shape.

I wish to confine my remarks in this paper to a much neglected, and, perhaps, much feared portion of this great field of Fungi, namely, the Agaricini of the Hymenomycetes. These rank in order as the highest of the Fungi, and all are of conspicuous size; their number can scarcely be less than in Europe, and the native species must constitute more than a third part of the whole. The single genus *Agaricus* comprises in Europe more than 1,200 species; these, with the added species of other genera belonging to the order, make a total of over 1,800 species. Our country is not less prolific of forms, and when the work is fairly done we will count well on to 2,000 species of the Agaricini. The genus *Agaricus* is the difficult one; the others are readily separated from it. *Lactarius* exudes a milky juice when broken; *Coprinus* dissolves into an inky fluid; *Marasmius* is tough and subcoriaceous, etc., etc.

I am in constant receipt of specimens of Agarics from friends and correspondents, and yet in most cases I am aware that I am able to make but a poor return for the trouble and expense they have incurred. To be sure a few species can be determined, as we may recognize a flowering plant, the *Amanitas*, the *Lepiotas*, and many of the subcoriaceous Agaricini, for example; but the great multitude of fleshy, putrescent species must have something else accompanying the specimen. And right here I wish to quote from Dr. Cooke's *Grevillea*, Vol. 12, p. 14: "Unfortunately, collectors and correspondents will not be persuaded to send drawings and details with their fleshy fungi, although for many years the Rev. M. J. Berkeley was continually urging it upon them. On account of this, not more than one-tenth of the Agaricini and *Boleti* sent here can be accurately determined."

The least that can be expected with an Agaric is to catch its spores, and ascertain their color, then fold the paper containing them and inclose it with the dried specimen; this assigns it at once to one of the five series of suborders into which the genus is divided. If the specimen in its fresh and perfect state can be sketched in colors, so much the better.

If a sketch cannot be made, then next in importance to the color of the spores is the color of the specimen, its form, size, etc. In another paper I will give a synopsis for the study and description of an Agaric.

The aids to the study of the Agaricini are, as in the other classes, chiefly foreign, while the descriptions of the native species are scattered in various publications, some of them inaccessible to the student; so that in reference to many species he is obliged to depend upon the friendly aid of some specialist. The text-book covering the most species is the *Hymenomycetes Europæi* of Fries, written in Latin. Cook's *Hand-book of British Fungi* is an excellent treatise in English and is now in course of republication. The reports of the New York State Museum of Natural History from the twenty-third to the thirty-fourth inclusive, contain the most important publications on Fungi that have yet been made in this country; they are the work of the most accomplished American mycologist, Prof. Chas. H. Peck. The *Illustrations of the British Fungi* by Dr. M. C. Cooke are invaluable in the study of the Agaricini; they are now in course of publication, and twenty eight parts have been issued, not yet completing the genus Agaricus.

NEW FUNGI.

BY J. B. ELLIS & B. M. EVERHART.

PEZIZA DINEMASPORIOIDES, E. & E.—Attached by a central point. black, bristly, minute, consisting of a basal membrane of cellulose-fibrose structure, with a subfimbriate margin and subtended by long (300—400 μ). black, spreading, bristle-like hairs, the whole much resembling a minute *Dinemasporium*. Asci 90—100 x 8—10 μ , gradually narrowed to the base. Paraphyses filiform; sporidia also filiform, multinucleate, yellowish or nearly hyaline, $\frac{1}{2}$ — $\frac{3}{4}$ as long as the asci.

On basal sheaths of dead *Andropogon*, Newfield, N. J., Oct. 1884.

HYPOCREA DIGITATA, E. & E.—Stroma yellowish, digitate, radiating from a central point and dividing into numerous (2 mm. in diam.), semi-cylindrical, finger-like lobes closely appressed to and surrounding the branch and extending longitudinally about 5 cm. Perithecia numerous. globose, small, with hyaline contents and black, slightly projecting ostiola. Asci cylindrical, 80—90 μ long. Sporidia crowded or overlapping, oblong, subhyaline, 1-septate, granular, slightly curved, 20—26 x 6—8 μ .

On a dead limb, at the "Notch" in the White Mountains, N. H., Sept. 1884. Miss S. Minns.

In the single specimen seen, the central part of the stroma was partially decayed while the digitate extremities were still fresh. Belongs in subgenus *Clintoniella*, Sacc., Syll. II, p. 532.

LEPTOSPHERIA SPARTINÆ, E. & E.—Perithecia gregarious (about $\frac{1}{4}$ mm.), covered by the blackened cuticle which is raised into little prominences over them and pierced by the papilliform and at length broadly perforated ostiolum. Asci 115–120 x 12–15 μ , surrounded by abundant paraphyses and containing eight two-ranked, broadly fusiform, pale-yellowish, 5-septate, 35–45 x 8–10 μ sporidia.

LEPTOSPHERIA STICTA, E. & E.—Perithecia scattered, subovate, membranaceous, buried under the blackened epidermis, which is pierced but not raised by the punctiform ostiola. Asci 100–125 x 15–20 μ , with abundant paraphyses. Sporidia 1 or 2-seriate, fusiform, pale yellow, 5-septate, very slightly constricted at the septa, ends obtuse, 30–40 x 7–9 μ .

Distinguished by its *punctiform* ostiola, which are the only outward indication of the buried perithecia. The ostiola are much the same as in *Hypoxylon punctulatum*, B. & Rav., appearing under the lens like punctures made by the point of a pin. The fruit is scarcely different from that of the preceding species.

In this and the next species, the part of the culm occupied by the perithecia is uniformly blackened.

LEPTOSPHERIA MARINA, E. & E.—Perithecia irregularly scattered, subelliptical, ($\frac{1}{2}$ – $\frac{3}{4}$ mm.), upper part hemispheric-conic, projecting, closely covered by the blackened epidermis, apex subtruncate with a papiliform ostiolum which is soon deciduous, leaving a broad opening. Asci 112–150 x 25–35 μ , narrowed into a substipitate base. Sporidia 2–3-seriate, fusiform or clavate-fusiform, yellowish, 1–3-septate (mostly 1-septate), slightly constricted at the middle, septum, 50–60 x 10–12 μ , ends sub-obtuse. In this case, the greater number of septa does not seem to indicate maturity. The perithecia are more prominent and the sporidia much longer than in *L. discors*, S. & E.

This and the two preceding species were collected during the summer of 1884, by Mrs. Caroline Treat at Cape May, N. J., on dead culms of *Spartina* lying on the beach.

LEPTOSPHERIA CLAVICARPA, E. & E.—Perithecia mostly seriate in lines $\frac{1}{4}$ –1 cm. long, covered by the blackened epidermis which is raised into a ridge above them and perforated by the inconspicuous ostiola. Asci broad, oblong-cylindrical, 75–100 x 22–25 μ , obtuse, with a short, narrow base. Paraphyses filiform. Sporidia crowded in several series, clavate-oblong, slightly curved, obtuse and rounded above, narrowed rather abruptly below, 7–9 septate, and when mature, deep yellow-brown, 25–40 x 8–10 μ , only slightly constricted at the septa. Spermatia in similar perithecia, oblong-cylindrical, slightly curved, hyaline, 3–5 x $1\frac{1}{4}$ μ .

The general appearance is that of *Sphaeria orthogramma*, B. & C. *Leptosphaeria culmifraga* (Fr.) has longer, narrower sporidia, and the perithecia are not usually so distinctly seriate. Found on dead culms of

Phragmitis communis, at Spirit Lake, Iowa, Jan. 1884, by Prof. J. C. Arthur.

SPHÆRELLA THALICTRI, E. & E.—Perithecia hypophyllous, 90 μ in diameter, of coarse, cellular structure, with a rather large opening above, hem spheric, (flattened when dry,) scattered on small (2–3 mm.), round, white spots with a dark border. Asci sessile, about 36 x 7 μ . Sporidia crowded, ovate-oblong, granular and nucleate, (becoming uniseptate?) 12–16 x 3–4½ μ .

On leaves of *Thalictrum dioicum*, Parsippany, N. J., Prof. Wm. Trelease. Sent also from Iowa by Mr. E. W. Holway.

SEPTORIA DIERVILLÆ, E. & E. Spots dark brown (2–3 mm.), mostly with a thick, swollen, raised border which is more pronounced on the upper side of the leaf and more or less shaded purplish black. Perithecia hypophyllous, small, black, innate-erumpent. Spores thread-like, often strongly curved, nucleolate, 25–35 x 1–1½ μ , with a slight greenish tinge.

On living leaves of *Diervilla trifida*, Magnolia, Mass., summer of 1884. Miss C. H. Clarke.

MELANCONIUM GRACILE, E. & E.—Pustules rather prominent, bursting out in a seriate manner through longitudinal cracks in the bark. Stroma minute, whitish. Spores oblong-cylindrical, pale brown, 15–18 x 4–5 μ , oozing out in a dull black mass.

On dead limbs of hickory, Plainfield, N. J., Geo. F. Meschutt.

GYMNOSPORIUM GRAMINEUM, E. & E.—Forming small, black, elongated or round patches 1–3 mm. in diameter, with the general aspect of *Torula herbarum*, Lk. Spores globose or subovate, 3–4 μ .

On dead culms and leaves of *Arundinaria*, "Low Country," South Carolina, June, 1884, H. W. Ravenel.

Quite distinct from *G. inquinaus*, Berk. which also occurs on *Arundinaria*.

MONILIA DIFFUSA, E. & E.—Forms a thin, ferruginous stratum on the matrix. Hyphæ inconspicuous, branching into chains of 6–10 acutely elliptical, simple, subfuscous, spores 7–10 x 3–4 μ and separated from each other by a short, hyaline connecting cell.

On rotten wood, White Mountains, N. H., Sept. 1884; Miss S. Minns.

GRAPHIUM LINDERÆ, E. & E.—Amphigenous but mostly hypophyllous, on large (½–1 cm.) indefinitely limited spots of a light yellow color at first but becoming dark brown and sometimes confluent. Hyphæ erect, simple, nearly straight, septate, brown, 25–30 x 4–5 μ , forming little pencil-like fascicles thickly scattered over the affected part of the leaf and bearing at their tips the clavate-cylindrical, brown, multiseptate conidia, 75–85 x 6–7 μ .

This much resembles *G. clavisporum*, B. & C.

NEW LITERATURE.

BY W. A. KELLERMAN.

FARLOW, W. G.—“Notes on some species of *Gymnosporangium* and *Chrysomyxa* of the United States;” in proceedings of the American Academy of Arts and Sciences, communicated Feb. 11th, 1885.

Dr. Farlow gave an account, in a paper on “The *Gymnosporangia* of the United States,” published in the Anniversary Memoirs of the Boston Society of Natural History in 1880, of his unsuccessful attempts to show, by means of cultures, the relationship of the *Gymnosporangia* to the forms of *Roestelia* growing near Boston. The present paper details continued and more extensive experiments of a similar character made in May and June, 1883. “The method of culture employed was the following: Specimens of different species of *Gymnosporangium* were gathered early in May, before the spores had begun to germinate, and while the spore masses were flat and not swollen into gelatinous protuberances, as is the case when they are moistened by showers. The specimens were then placed in watch-glasses under moistened glasses, each species by itself, when the spore masses soon expanded, and the spores began to germinate. It was in this way easy to arrange so that the spores of the different species were kept pure,—a fact confirmed by microscopic examination. As the spores germinated, the sporidia, of a bright orange color, dropped into the moist watch-glasses, and were used at once for infecting the desired plants. Two kinds of material were used. The first consisted of leaves of different *Pomaceæ*, which were freshly gathered in the Botanic Garden of Cambridge, and at a distance from any species of *Juniperus* which could have been infested by a *Gymnosporangium*. The leaves were placed on moistened glass slides, and arranged on zinc stands under bell-glasses. The sporidia were then carefully dropped upon the leaves, which were immediately covered by a bell-glass. The leaves under each glass were sown with the sporidia of but one species, and subsequently, when it was necessary to remoisten the slides, the bell-glasses were removed for a moment only, and at no time were the leaves under more than one bell-glass exposed. I also used a number of small seedlings of *Pomaceæ*, each pot being covered by a glass receiver. The seedlings were supposed to be in a healthy condition, but, to serve as a check, a number of similar seedlings were kept on which no sporidia were sown. The young plants were inoculated, either by dropping the sporidia upon them, or, in cases where the leaves were not in such a position to retain drops well, small pieces of the gelatinous spore masses were placed on them, it first being ascertained that the spores had begun to germinate. After three or four days it was necessary to remove the remains of the gelatinous masses in order to prevent moulding. After the lapse of a week, at which period the germinal

tubes, if ever, must have made their way into the leaves, I attempted in a few cases to remove the glass receivers and continue the cultures in the open air. This, however, was impossible, for the plants wilted to such an extent that I was obliged to keep them constantly covered. European experimenters usually expose their cultures to the air after a few days, but it is doubtful whether this can be done in our climate except in the most favorable cases, so great and sudden are the changes of moisture and temperature." The results are summarized as follows :

Spermogonia appeared after sowing the sporidia of

G. fuscum, var. *globosum* on seedling apples, on *Crataegus oxyacantha* (very abundant), on *C. Douglasii*, and on apple leaves under bell-glass. In cultures of previous years, also on *C. tomentosa*.

G. macropus on apple seedlings, on *C. Douglasii*, and on shoots of *Pyrus arbutifolia* and *Amelanchier*. Also in previous cultures on *C. tomentosa* and *Amelanchier*.

G. clavipes on apple seedlings and shoots of *Pyrus arbutifolia* and *Amelanchier*.

G. biseptatum on *Amelanchier* leaves and shoots, and previously on *C. tomentosa*.

It will be noticed that *Spermogonia* were produced, but no *Æcidia* appeared, and "in the absence of *Æcidia*, can we infer anything from the *Spermogonia*?" After discussing in detail the experiments with the different species on the different host-plants, Dr. Farlow gives the following as the conclusions to be drawn :

1. The æcidium of *G. biseptatum* is probably *Ræstelia botryapites*.
2. The æcidium of *G. globosum*, to be kept distinct from *G. fuscum*, is possibly *Ræstelia aurantiaca*.
3. The æcidium of *G. macropus* is to be sought among the *Ræstelia* growing especially on apples and *Amelanchier*.

The remaining three pages of the paper refer to species of *Chrysomyxa* found by himself and Mr. Edwin Faxon in the White Mountains. On the upper surface of leaves of *Ledum* a form was found undistinguishable from the teleutosporic condition of *Chrysomyxa Ledi* (A. & S.). "The spores were produced in small numbers in chains, but at maturity became free, and were then globose or broadly elliptic, measuring 24—38 x 20—26 μ ." Besides this epiphyllous form, which was decided to be *Uredo ledicola*, Peck, a hypophyllous form was found whose spores "were distinctly narrower and more acutely elliptical, measuring 24—31 x 12—19 μ , and the episporium was less rough." Dr. Farlow says "there can be no doubt that the hypophyllous form is the uredo of *Chrysomyxa Ledi*," and then adds: "Whether our epiphyllous form should be considered distinct from the hypophyllous must, for the present, remain uncertain. I found the differences stated above constant in all the specimens I examined, and they were not few in number. It may be that the two forms are modifications of the same species depending on the different structure of the upper and under side of the leaves, but the differences are cer-

tainly greater than those of many forms which are regarded as distinct by good mycologists. It is, in all events, interesting to know that we have in the White Mountains both the uredo and teleutosporic forms of *Chrysomyxa Ledi* growing in close proximity to *Abies nigra* in regions where it is badly infested with a *Peridermium* which, as stated in my paper already referred to, I am unable to distinguish from *P. abietinum*, one form of which is said by De Bary, in his exhaustive paper on the subject, to be the æcidium of *Chrysomyxa Ledi*." On *Abies Canadensis*. Mr. A. B. Seymour found, in Massachusetts, a *Cæoma*, whose scarcely ripe spores were smaller than in *C. Abietis-pectinatae*, Rees, and which Dr. Farlow designates, "until more exact information can be obtained," as *C. Abietis-Canadensis*.

ARTHUR, J. C.—"Preliminary List of Iowa Uredineæ," in Bulletin of the Iowa Agricultural College, issued by the Department of Botany, Nov. 1884.

The list contains the names, in alphabetical order and with host-plants, of 134 species collected by Messrs. Arthur, Holway and Bessey. The genera represented and the number of species are the following: *Uromyces*, 19; *Puccinia*, 48; *Phragmidium*, 4; *Gymnosporangium*, 3; *Melampsora*, 2; *Coleosporium*, 2; *Chrysomyxa*, 1; *Uredo*, 4; *Cæoma*, 1; *Æcidium*, 48; *Röestelia*, 2. The new species are as follows: *Uromyces Rudbeckiæ*, Arthur & Holway, on *R. laciniata*; *Puccinia Cypripedii*, Arthur & Holway, on *C. pubescens*; *P. Eleocharis*, Arthur, on *E. intermedia* and *E. palustris*; *P. Sporoboli*, Arthur, on *S. heterolepus*; *P. Stipæ*, Arthur, on *S. spartea*; *Phragmidium gracile* (Farlow), *P. incrasatum* Lk. var. *gracile*, Far., in Ellis' N. A. F., 282, on *Rubus strigosus*; *Coleosporium Viburni*, Arthur, on *V. Lentago*; *Uredo Boutelouæ*, Arthur, on *B. racemosa*; *Æcidium Napææ*, Arthur & Holway, on *N. dioica*.

CRAGIN, F. W.—"Lower Fungi of Kansas;" in Bulletin Washburn College of Nat. Hist., I, p. 62.

A list of 68 identified species, with descriptions of the following:

RHINOTRICHUM PULVERACEUM, Ellis in litt.—On dead wood and bark, Topeka. Winter. Occurring with *Torula binale*, C. & E. Forming a thin, pale, yellowish white, subgranulose layer on the matrix; hyphæ much branched, the ends swollen and smooth; the conidia (appearing at first inside these swollen ends and pushing out through the investing membrane?) variable in size and shape, globose, 5–9 μ in diameter, or elliptical, 5–12 x 5–7 μ ; the elliptical conidia mostly with a slight apiculus at one end. The branching hyphæ are sparingly septate and mostly not over 3 μ in diameter. Peculiar in the smooth, swollen tips. The sterile hyphæ form a thin, white, soft layer like a *Corticium* on the surface of the wood.

PEZIZA CRAGINIANA, E. & E., in litt. On very rotten wood, Topeka, May. Stipitate, 2–3 mm. in diameter, smooth, discoid, pale waxy-white when fresh, darker when dry; stem filiform, 2–3 mm. long; asci cylindrical, 75 x 6 μ , sessile or nearly so; paraphyses linear, rather stout, often branched above, but scarcely thickened; sporidia ovate-elliptical, hyaline (yellowish in the asci), 2-nucleate, 5–6 x 2½–3 μ , uniseriate or sometimes biseriate. Allied to *P. gracilipes*, Cke.

PEZIZA HEMISPHERICA, Wigg., in litt. var. *SUBCALVA*, Ell.—Differs from typical *hemispherica* chiefly in the possession of a rather sparing hairy coat. On damp ground in woods, Topeka, June and July.

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No. 4.

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ENUMERATION OF THE NORTH AMERICAN CERCOSPORÆ.

WITH DESCRIPTIONS OF THE SPECIES.

BY J. B. ELLIS AND BENJAMIN M. EVERHART.

67. *CERCOSPORA MONOICA*, Ell. & Hol. Jour. of Mycol. I, p. 6.

Epiphyllous, forming clusters of minute, snuff-brown tufts on brown. dead spots with a yellow shaded border, and on the green parts of the leaf which soon become yellowish and finally brown. Hyphæ densely tufted, pale brown, continuous, abruptly undulate and denticulate above, $35 \times 2\frac{1}{2} \mu$. Conidia slender, nearly straight, yellowish, granular, becoming indistinctly 3—8-septate. Differs from *C. tuberosa*, E. & K. (which is the same as *C. glaucescens*, Winter in Rabh. F. Eur. 3080) in its epiphyllous growth, larger tufts of hyphæ and in its shorter, narrower, and less distinctly septate conidia.

On *Amphicarpæa monoica*, July, Iowa (Holway.)

68. *CERCOSPORA GNAPHALII*, Hark. Bull. Cal. Acad. Sci., Feb. 84, p. 38.

"Spots broad, indeterminate. Tufts aggregated. Hyphæ short. brown. Conidia pale brown, attenuated above, 3—7 septate, $120 \times 16 \mu$."

On *Gnaphalium*, Cal. (Harkness.)

69. *CERCOSPORA GOSSYPINA*, Cke. Grev. XII, p. 31. Rav. F. Amer. 583.

Hyphæ epiphyllous, flexuous, brown (120—150 μ), on indistinct, brownish, indeterminate spots. Conidia attenuated above, flexuous, 5—7 septate, hyaline, 70—100 x 3 μ .

On leaves of *Gossypium*, S. Carolina (Ravenel.)

70. *CERCOSPORA CALLICARPÆ*, Cke. Grev. VI, p. 140. Rav. F. Amer. 64.

Epiphyllous. Spots indeterminate, reddish brown. Hyphæ short, simple, dark, septate. Conidia cylindrical, scarcely attenuated, 4—5 septate, 60—70 μ long.

On leaves of *Callicarpa*, Fla. (Ravenel.)

71. *CERCOSPORA SANGUINARIÆ*, Pk.

Spots large, indeterminate, smoky-brown, sometimes obscurely mottled or subreticulate, with darker lines on the upper surface. Hyphæ hypophyllous, few, scattered or subcaespitose, rather long, colored, often nodulose above. Conidia, subcylindrical, obtuse, 4—8 septate, colorless, 35—60 μ long.

On living or languishing leaves of *Sanguinaria Canadensis*, Aug., N. Y. (Peck.)

Owing to the scattered mode of growth of the hyphæ, the fungus is scarcely visible, but the large, smoky-brown spots are very conspicuous.

72. *CERCOSPORA RANUNCULI*, Ell. & Hol. Jour. of Mycol. I, p. 5.

Forming brown, indefinitely limited patches on the under side of the leaves which become dirty-yellowish above, without the formation of any well defined spots. Hyphæ in scattered tufts, brown, continuous, abruptly undulate, crooked and subnodulose above, 76—90 x 3—4 μ . Conidia slender, nucleolate, becoming 4—6 septate, 70—85 x 3—4 μ .

On leaves of *Ranunculus repens*, July, Iowa (Holway.)

73. *CERCOSPORA PASSALOROIDES*, Winter. Hedwigia, May, 1883, p. 71.

Spots indeterminate, yellowish or slightly fuscous, at length occupying nearly the whole leaf. Hyphæ fasciculate, simple or sparingly branched, torulose, especially towards their tips, remotely septate, sub-fuscous, 50—70 x 5 μ . Conidia subclavate, slightly attenuated above, 1—2 septate, somewhat constricted at the lower septum, slightly fuscous, 23—65 x 5—6 μ .

On leaves of *Amorpha canescens*, Illinois (Seymour.)

74. *CERCOSPORA OCCIDENTALIS*, Cke. Hedwigia, 1878, p. 39. Rav. Fungi Amer. 65.

Epiphyllous on indefinite, inconspicuous, suborbicular spots (2—3 mm.), only noticeable by being a little darker than the other parts of the leaf. Hyphæ short, brown, densely fasciculate on a tubercular base, septate, brown. Conidia cylindric-clavate, attenuated above, hyaline, multiseptate, 100—120 μ long.

On leaves of *Cassia occidentalis*, South Carolina.

75. *CERCOSPORA DESMODII*, E. & K. Bull. Tor. Bot. Club, XI, p. 121.

On reddish brown, roundish or irregularly shaped and rather indefinitely limited spots, 2—3 mm. in diameter. Hyphæ mostly hypophyllous, 70—80 x 3—4 μ , brown, 1—3 septate, undulate or often abruptly bent above, rising in loose spreading tufts of 6—8 from a minute tubercular base. Conidia oblong-cylindric and nucleate, becoming ob-clavate-cylindric and mostly 3-septate, 40—50 x 3.5—4 μ . The spots become more or less confluent and the leaf assumes a reddish brown hue.

On *Desmodium acuminatum*, July, Kansas (Kellerman.)

e. Spots none, or at least not very conspicuous.

a. Tufts scattered.

76. CERCOSPORA SPARSA, Cke. Grev. XII, p. 31. Rav. F. Amer. 590.

Hyphæ hypophyllous, short, scattered, forming indeterminate, fuscous patches which appear under the lens as a scanty, fuscous down. Conidia attenuated above, 2—3 septate, hyaline, 50—70 x 3 μ .

On leaves of *Kalmia latifolia*, S. Carolina (Ravenel.)

77. CERCOSPORA SPHÆRIÆFORMIS, Cke. Grev. VI, p. 140. Rav. F. Amer. 63.

Hyphæ amphigenous, short, simple, dark brown, in densely fasciculate, sphæriæform tufts which are collected in groups forming dark brown patches on the leaf. Conidia linear, attenuate above, multiseptate, 60—80 μ long.

On (elm ?) leaves, Fla. (Ravenel.)

78. CERCOSPORA PULVINULA, C. & E. Grev. VII, p. 40. N. A. F. 644.

Punctiform, hypophyllous. Hyphæ very short, collected into minute subolivaceous tufts sprinkled over the lower surface of the leaf. Conidia cylindrical, faintly 1—2 septate, hyaline, 20—35 μ long.

On leaves of *Ilex opaca*, Newfield, N. J.

79. CERCOSPORA EPILOBII, Schm. De Thuemen, Fungi Austriaci, 532. Mich. II, p. 642.

"Tufts punctiform, gregarious, subolivaceous. Hyphæ fasciculate, round, 50—70 x 5 μ , slightly tortuous, denticulate, olivaceous, subhyaline above, guttulate, spuriously septate. Conidia cylindrical, 40—50 x 5—5½ μ 2—3 septate, not constricted, guttulate, hyaline."

On *Epilobium alpinum*, White Mts., N. H. (Farlow.)

The description is copied from Michelia. We have seen no specimens.

80. CERCOSPORA RAFINESQUIÆ, Hark. Cal. Bull. Acad. Sci., Feb. 1884.

"Hypophyllous, in minute tufts covering a great part of the leaf: hyphæ brown, very short. Conidia oblong, brown, 2—7 septate, 20—30 x 6 μ ."

On living leaves of *Rafinesquia Californica*, San Francisco, Cal., May."

81. CERCOSPORA DIOSPYRI, Thuem. Mycotheca Universalis, 1273. Grev. XII, p. 31.

Hyphæ nearly straight or somewhat flexuous, continuous, slender, olivaceous, collected in small tufts which form orbicular patches (3—4 mm.)

on the under side of the leaf which is marked on the upper side with corresponding rusty brown, indefinite spots. Conidia obclavate, subacute at the ends, 4—7 septate, and sometimes constricted at the septa, nearly hyaline, 30—50 x 4 μ .

On leaves of *Diospyros Virginiana*, S. Carolina (Ravenel.)

82. CERCOSPORA VELUTINA, E. & K. Bull. Torr. Bot. Club, XI, p. 122.

Amphigenous. Hyphæ pale olivaceous, simple, continuous, more or less bent and toothed above, forming a dense, velvety growth over the surface of little dark-colored tubercular swellings 1 mm. or less in diameter, which are collected in groups or irregularly scattered over the surface of the leaf. Conidia pale olive-brown, subequal or attenuated above, curved, sparingly septate, 75—100 x 3 μ .

On leaves of *Baptisia*, August, Kansas (Kellerman.)

b. Tufts effused.

83. CERCOSPORA POLYGONORUM, Cke. Hedwigia, March, 1878, p. 39. Rav. Fungi Amer. 66. Ellis N. A. F. 549. *Helminthosporium Hydropiperis*, Thuem. M. U. No. 1087.

Hyphæ hypophyllous, loosely fasciculate, brown, sparingly septate, 75—100 x 5—6 μ , forming olive black suborbicular patches (1—1 cm.) or often continuous over the entire surface of the leaf which, if still young and green when attacked by the fungus, shows on the upper surface pale yellowish spots, indicating the position of the patches of hyphæ beneath. Conidia cylindrical, 3—5 septate, with a slight fuscous tint, 50—80 x 7—9 μ .

According to the description in Hedwigia this should be *epiphyllous*, but all the specimens in the three collections cited show the fungus on the lower surface of the leaves. There is a slight discrepancy between the description in Hedwigia and that given by De Thuemen in M. U., but the specimens are certainly the same. We have not found conidia with more than 6 septa, generally 3—5. We can not say with certainty whether De Thuemen's specific name should have preference. Cent. XI, (Mycotheca) was issued in 1878, but whether before or after the March No. of Hedwigia, we cannot say.

84. CERCOSPORA NIGRICANS, Cke. Grev. XII, p. 30.

Hyphæ epiphyllous, fasciculate, short, brown, forming indeterminate, irregular, dark colored patches. Conidia cylindrical or slightly attenuated above, 3—5 septate, hyaline, 40—60 x 2 μ .

On leaves of *Cassia obtusifolia*, S. Carolina (Ravenel.)

The fungus appears at first as groups of minute, yellowish pustules (much resembling an *Entyloma* to outward appearance) soon becoming brown in the center and finally overspread with the dark brown hyphæ. There are no definite spots.

85. CERCOSPORA OLIVACEA (B. & Rav.) *Helminthosporium olivaceum*, Berk. & Rav. Grevillea III, p. 102. *C. Berkeleyi*, Cke., Grev. XII, p. 30. *C. Seymouriana*, Winter, Bull. Torr. Bot. Club, X, p. 50. *C. olivacea*, (B. & Rav.) Rab.-Winter, Fungi, 2974.

Hyphæ hypophyllous, fasciculate, short (40—60 μ), torulose, sparingly septate, brown, forming indeterminate, dark brown patches or spreading over the greater part of the leaf. Conidia attenuate clavate, 80—120 x 5—7 μ , multiseptate and often constricted at the septa, brownish.

On living leaves of *Gleditsia triacanthos*, Carolina (Ravenel), Illinois (Seymour.)

86. CERCOSPORA GRISEA, C. & E. Grev. V, p. 49. N. A. F. 49.

Hyphæ short, simple, fuscous, fasciculate, covering the leaves and stem with minute, punctiform tufts scarcely distinguishable by the naked eye but imparting a grayish color to the affected parts. Conidia linear, multiseptate, 100—125 μ long.

On living leaves, stems and flowers of *Polygala lutea* and *P. cruciata*. Newfield, N. J.

87. CERCOSPORA CONSOCIATA. Winter. Hedwigia, May, 1883, p. 70.

Tufts hypophyllous, densely gregarious, forming large, dark colored patches generally limited by the veinlets of the leaf which shows corresponding dark or greenish spots above. Hyphæ fasciculate, short, 35—50 x 5 μ , nodulose, dark, septate. Conidia very narrow-subclavate-filiform, slightly thickened below, remotely multiseptate, with a pale fuscous tint, reaching 125 μ long, and 3½ μ thick below.

On living leaves of *Dipteracanthus ciliolus*, Illinois (Seymour.)

88. CERCOSPORA SORDIDA, Sacc. Mich. II, p. 149.

Hypophyllous, effused, forming dull olivaceous patches. Hyphæ loosely fasciculate, short, reddish-brown (under the microscope.) Conidia narrow-obclavate, 80—110 x 4 μ , apices acute, 4—6 septate, olivaceous.

On living leaves of *Tecoma radicans*, Ga. (Ravenel.) Found also at Newfield, N. J.

89. CERCOSPORA EFFUSA (B. & C.) *Cladosporium effusum*. B. & C. Grev. III, p. 106.

Hyphæ hypophyllous, fasciculate, subnodulose, 35—45 x 3 μ . Tufts much effused, forming indefinite, rusty brown patches on the lower side of the leaf which is marked above with pale yellowish, indefinite spots. Conidia subhyaline, cylindric-clavate, with one or more septa, 45—60 x 3—3½ μ .

On living leaves of *Lobelia syphilitica*, Iowa (Holway.), and *L. cardinalis*, Kansas (Kellerman.)

90. CERCOSPORA MURINA, E. & K. Bull. Torr. Bot. Club, XI, p. 122.

Hypophyllous, on large (.5—1 cm.), roundish, indefinitely limited, dirty brown spots (dirty white above). Hyphæ effused, mouse-colored, branched, septate, clear fuscous brown, 75—100 x 3—4 μ . Conidia oblong or oblong-cylindric, 3-septate, brownish, sometimes slightly constricted at the septa, 25—35 x 4—5 μ . Looks like a fine, mouse-colored down overrunning spots previously occupied (?) by another *Cercospora* (*C. granuliformis*, Ell. & Hol.)

On leaves of *Viola cucullata*, Kansas (Kellerman.)

91. CERCOSPORA FUSCO-VIRENS, Sacc. Mich. II, p. 149.

Hyphæ fasciculate-intricate, branching, 80—120 x 4 μ , flexuous, denticulate, septate-guttulate, of an olivaceous yellow, forming dirty greenish patches, either limited by the veinlets or spreading over nearly the whole lower side of the leaf which is indistinctly mottled with yellow above. Conidia elongated or fusoid, rather obtuse at each end, pale olive, curved, 30—40 x 5—6 μ , and 3—4 septate when mature.

On living leaves of *Passiflora lutea*, Cobden, Illinois, Oct. 1883, (Earle).

92. *CERCOSPORA PYRI*, Farlow. Appalachia, Vol. III, p. 250.

"Hypophyllous, forming large, indefinite, blackish spots on the leaves. Hyphæ fasciculate, simple, nearly hyaline, stout, subdenticulate above, 30—60 x 5—7 μ . Conidia fusiform, mostly a little curved, 3—6 septate, hyaline, ends obtuse, 30—60 x 4—6 μ ."

On living leaves of *Pyrus arbutifolia*, Wisconsin (Pammel), New Hampshire (Farlow.)

93. *CERCOSPORA ACETOSELLA*, Ell. Bull. Torr. Bot. Club, VIII, p. 65.

Forming leaden gray patches on the withered leaves. Hyphæ erect, short, sparingly septate, fasciculate in minute tufts thickly scattered over the affected leaves. Conidia linear obclavate, nucleate (becoming septate ?) 50—70 μ long.

On leaves of *Rumex acetosella*, Sept., Newfield, N. J.

94. *CERCOSPORA DIOSCOREÆ*, E. & M. Am. Nat., Dec. '82, p. 1003.

Hyphæ caespitose, brown, scarcely septate, 30 x 3½ μ , forming indefinite, dirty brown patches (¼—1 cm.) on the lower surface of the leaf which is mottled with brown and yellow above. Conidia yellowish-subhyaline, subcylindrical, only slightly attenuated above, 3—8 septate, 50—90 x 4—5 μ .

On leaves of *Dioscorea villosa*, Penn. (Dr. Martin.)

95. *CERCOSPORA CANA*, Sacc. F. Ven. Nov. V, p. 188. N. A. F. 1248. *Fusidium canum*, Pass. in Thuem. M. U. 378.

Hypophyllous, effused, white, covering considerable areas of the leaves. Hyphæ continuous, subramose or denticulate above, hyaline, 30—35 x 4—5 μ . Conidia cylindric-obclavate, 60—90 x 4—5 μ (exceptionally 100—120 x 6 μ), 3—4 septate and guttulate, hyaline and slightly curved.

On leaves of different species of *Erigeron*, Eastern, Middle and Western States.

96. *CERCOSPORA CLAVATA* (Gerard) *Helminthosporium clavatum*, Ger. Bull. Torr. Bot. Club, V, p. 27. *Virgasporium clavatum* (Ger.) Cke. in Grevillea III, p. 182, and IV, p. 69, and *Cercospora clavata* (Ger.) Pk. in 34th Rep. N. Y. State Mus. p. 48. Ellis N. A. F. 823 (a.)

Spots small, numerous, irregular, indefinite, often confluent. Hyphæ hypophyllous, minutely tufted, abundant, short, thick, subflexuous, subnodulose, colored, 25—40 μ long. Conidia very unequal in length, cylindrical to bacillary, slightly colored, 40—125 μ long, 3—7 septate. The tufts of hyphæ are so numerous and crowded as to form a continuous, velvety stratum.

On living leaves of *Asclepias incarnata*, N. Y. (Peck & Gerard) and at Newfield, N. J., on *A. obtusifolia*.

N. A. F. 823 (b) on leaves of *Gerardia quercifolia* is probably distinct, but without fresh specimens we will not now separate it.

97. CERCOSPORA PHASEOLORUM, Cke. Grev XII, p. 30. Rav. Fungi Amer. 584.

“Hyphæ epiphyllous, fasciculate, short, brownish on indeterminate. brownish, inconspicuous spots. Conidia sub-cylindrical, 3—5 septate. 40—50 x 4 μ , pallid.

On leaves of *Phaseolus*, S. Carolina (Ravenel.)

Spores not half as long as in *C. olivacea*, Sacc.

98. CERCOSPORA AMPELOPSIDIS, Pk. 30th Rep. N. Y. State Mus. p. 55. (*C. pustula*, Cke. Grev. XII, p. 30 ?)

Hyphæ fasciculate, brown, 2—3 septate, subundulate above, 70—90 x 6—7 μ , hypophyllous, forming brown patches 2—3 mm. in diameter and limited mostly by the veinlets of the leaf. Conidia subcylindrical, brown, 3—4 septate. The upper surface of the leaf is marked with dark brown spots around which it is a pale reddish tint.

On *Ampelopsis quinquefolia*, Bethlehem, N. Y. (Peck). Pennsylvania (Rau.) Found also in New Jersey.

The conidia on *C. pustula*, Cke., are said to be *hyaline*. We have not been able to find any conidia on the specimen in F. Am., but their general appearance is the same as that of the N. J. and Penn. specimens.

99. CERCOSPORA LUPINI, Cke. Hedwigia, 1878, p. 39. Rav. Fungi Amer. 67.

On indefinitely limited, inconspicuous, dark colored spots, scarcely distinguishable from the surrounding parts of the leaf. Hyphæ branching and septate, brown. Conidia cylindrical, straight, 3—5 septate, scarcely attenuated, hyaline, 50—70 x 3 μ .

On leaves of *Lupinus diffusus*, S. Carolina (Ravenel.)

100. CERCOSPORA RACEMOSA, E. & M. Am. Nat., Nov. 1884.

Effused in small (1—2 mm.) patches which are greenish at first, then rusty brown and often more or less confluent. Hyphæ interwoven, bearing the oblong or oblong cylindrical conidia in a racemose manner on short, lateral branches and at their tips. Conidia hyaline, 1—5 septate, 20—80 x 5 μ .

On the under side of leaves of *Teucrium Canadense*, Iowa (Arthur.)

This is certainly very closely allied to *C. ferruginea*, Fekl, differing principally in its shorter, paler spores, and it may be that a further comparison may reduce this to a mere variety of that species.

100 a. CERCOSPORA DULCAMEARÆ (Pk.) *Ramularia Dulcamaræ*, Pk. 33d Rep. N. Y. State Mus. p. 30.

Hyphæ nodulose, abruptly bent and branched irregularly, pale brown (under the microscope), continuous, 30—60 x 5—7 μ , bearing the conidia

both terminal and lateral. Conidia oblong to cylindrical and clavate-cylindrical, 1—3-septate, brownish, 15—50 x 4—5 μ . The hyphæ form indefinite, subviolaceous, or greenish-lead-colored patches on the lower surface of the leaf, and also more sparingly so above but without any distinct spots.

On leaves of *Solanum Dulcamara*, New York. These notes are from specimens received from Prof. Peck who remarks that "the spots are very unequal in size and often confluent and, when the leaf fades, retain their greenish hue for a longer time." This is still recognizable in the dry specimens (collected several years ago?) The brown hyphæ as well as the character of the conidia must remove this from *Ramularia*. We certainly think it a good *Cercospora*. In the Report cited it is remarked that "this species in some respects approaches *Peronospora*." We can not say whether this was inadvertently written for *Cercospora*.

101. *CERCOSPORA POLYTRICHA*, Cke. Grev. VII, p. 35. Rav. F. Amer. 291.

Hypophyllous, forming broad, sooty colored patches but not on any definite spots, at least none that are visible on the upper side of the leaf. Hyphæ multiseptate, joints subquadrate, toruloid, brown. Conidia obclavate, biseptate, 30—50 μ long.

On leaves of *Quercus virens*, S. Carolina (Ravenel.) This is an anomalous species and is not improbably the conidial stage of some *Capnodium*. The hyphæ spring mostly from a small tubercular base (rudimentary perithecium.)

B. Hyphæ nearly hyaline (*Cercosporella*, Sacc.)

102. *CERCOSPORA CHIONEAE*, E. & K. Bull. Tor. Club, XI, p. 122.

Amphigenous, but mostly epiphyllous, on large (.5—1 cm., or, by confluence, 3—4 cm.) dark, reddish brown spots with a brown, yellow-shaded, but not raised, border. Hyphæ densely tufted, subhyaline, mostly 18—30 x 4—5 μ , but often elongated to 35 or 40 μ and then somewhat undulate or crooked above. Conidia vermiform or clavate-cylindric, 54—90 x 4—5 μ and 3—8-septate.

The conidia are very abundant and appear to the naked eye like a sprinkling of white powder on the brown spots. Different throughout from *C. cercidicola*, Ell.

On leaves of *Cercis Canadensis*, July, Kansas (Kellerman.)

104. *CERCOSPORA PERSICA*. Sacc. F. Ven. Nov. V, p. 189. Rab.-Winter Fungi, E., 3081.

Hyphæ hypophyllous, filiform, somewhat branched above, continuous, hyaline, forming irregularly shaped, rather indefinitely limited white patches on the under side of the leaves which are correspondingly marked with pale, yellowish, indefinite spots above. Conidia cylindrical, 40—50 x 4—5 μ , imperfectly septate, or remotely guttulate, hyaline or subhyaline.

On peach leaves, Illinois (Earle.)

[CONTINUED ON PAGE 61.]

NEW LITERATURE.

BY W. A. KELLERMAN.

FARLOW, W. G.—“Notes on Fungi,” in the Botanical Gazette, Feb. 1885.

Referring to Proc. Amer. Acad. XVIII, 76, where it was stated that *Uredo Toxicodendri*, B. & Rav. is the teleutospore form with which *Pileolaria brevipes*, B. & Rav. is to be associated as the uredo form, Dr. Farlow states that during the past summer he obtained the germination of the spores of the so-called *Uredo Toxicodendri*, and found that their germination is that of a uredo and not of a teleutospore. Repeated attempts failed to make the so-called *Pileolaria brevipes* germinate. * * *

Peronospora australis, described by Spegazzini in 1881, seem to be identical with *P. sicycola*, Trelease, hence the former name has the priority, unless the species proves to be identical with *P. Cubensis*, B. & C. *P. Halstedii*, Farlow, seems to be our most widely distributed species, reaching “its most luxuriant development on species of Silphium and Helianthus in the Western States.” * * * *Entyloma Besseyi*, Farlow is, according to Dr. Winter, *E. Physalidis*, Cke. & Kalch.

FARLOW, W. G.—“The Synchytrium of the United States,” in the Botanical Gazette, March, 1885.

A full account, covering three and one-half pages, is given of the genus Synchytrium followed by the diagnosis as follows:

SYNCHYTRUM, D. By. & Wor.—Unicellular fungi inhabiting the epidermal cells of living plants, entirely destitute of mycelium. Reproduction by resting spores and sori containing zoosporangia from which are produced zoospores having one, or rarely two, cilia. Conjugation wanting.

The species of the United States are as follows:

1. *S. papillatum*, Farlow, on *Erodium cicutarium*, L. Her., California.
2. *S. Holwayi*, Farlow, on *Monarda*, Iowa.
3. *S. fulgens*, Schroeter, on *Oenothera biennis*, L., California.
4. *S. innominatum*, Farlow, on *Malacothrix*, California.
5. *S. decipiens*, Farlow, on *Amphicarpæa monoica*, Nutt., Mass. to Minn. South to Md.
6. *S. Anemones*, Wor., on *Anemone nemorosa*, L., Mass. to Wis.
7. *S. anomalum*, Schroeter, on *Adoxa Moschatellina*, L., Iowa.
8. *S. aureum*, Schroeter, on *Lysimachia quadrifolia*, L., Iowa.
9. *S. Myosotidis*, Kuehn, var. *Potentillæ*, Schroeter, on *Potentilla Canadensis*, L., Mass.
10. *S. pluriannulatum* (Curtis in herbarium), on *Sanicula Marylandica* and *S. Menziesii*, Hook. & Arn., Ala. to Ill., Cal.

PECK, CHAS. H.—“Report of the Botanist” in the 35th Annual Report, N. Y. State Mus. of Nat. Hist.

The Report was transmitted to the Legislature in 1882; it covers forty pages and contains, of new species, descriptions of the following : *Agaricus sulcatipes*, Peck; *A. hærens*, Peck; *A. tiliophilus*, Peck, on dead trunks and branches of *Tilia Americana*; *A. nitidipes*, Peck; *A. epimyces*, Peck, parasitic on fungi; *Hygrophorus fuliginus*, Frost MS.; *H. flavodiscus*, Frost MS.; *Marasmius salignus*, Peck, on bark of living willow trees; *Polyporus immitis*, Peck, on decaying ash trunks; *P. fraxinophilus*, Peck, on trunks and branches of dead or languishing ash trees; *Thelephora rosella*, Peck, dead branches of *Alnus incana*; *Clavaria pinophila*, Peck; *Discella hysteriella*, Peck, on decorticated wood; *D. albomaculans*, Peck, on dead twigs of grape-vines; *Glœosporium fraxinea*, Peck, on living leaves of *Fraxinus pubescens*; *Septoria cannabina*, Peck, on living leaves of *Cannabis sativa*; *S. Sicyi*, Peck, on *Sicyos angulatus*; *S. musiva*, Peck, leaves of *Populus monilifera*; *Phyllosticta rubra*, Peck, leaves of *Cratægus tomentosa*; *P. variabilis*, Peck, leaves of *Rubus odoratus*; *Acalyptospora Populi*, Peck, leaves of *Populus grandidentata*; *Macrosporium transversum*, Peck, on living leaves of *Carex stricta*; *Botrytis ceratioides*, Peck, decaying wood of *Abies Canadensis*; *Verticillium Lactarii*, Peck, on putrescent *Lactarii*; *Cercospora Lepidii*, Peck, on *L. campestre*; *C. Daturæ*, Peck, leaves of *D. Stramonium*; *C. longispora*, Peck, on *Lupinus perennis*; *C. varia*, Peck, on leaves of *Viburnum acerifolium*; *Ramularia Ranunculi*, Peck, on *R. recurvatus*; *R. Vaccinii*, Peck, on *V. corymbosum* and *V. Pennsylvanicum*; *R. Hamamelidis*, Peck, on *H. Virginica*; *R. aquatilis*, Peck, on leaves of *Potamogeton lonchites*; *Peziza singularia*, Peck, on the under surface of living leaves of *Ranunculus hispidus*; *Tympanis Nemopanthis*, Peck, dead stems and branches of *Nemopantes Canadensis*; *Cenangium betulinum*, Peck, dead bark of *Betula populifolia*; *Triblidium clavæsporium*, Peck, decorticated wood of *Salix nigra*; *Gymnascella aurantiaca*, Peck, bones in damp places; *Valsa tomentella* Peck, bark of *Betula populifera*; *Sphæria petiophila*, Peck, petioles of fallen leaves of *Acer spicatum*; *Sphærella fraxinea*, Peck, on fallen leaves of *Fraxinus Americana*; and *Venturia curviseta*, Peck, fallen leaves of *Nemopantes Canadensis*.

Prof. Peck forms a new genus with one species, as follows :

GYMNASCELLA.—Perithecia wanting; asci numerous, subglobose, produced upon or among slender, branching filaments.

Externally this fungus has the aspect of species of *Sporotrichum*, but the spores are produced in asci.

Gymnascella aurantiaca, Peck.—Filaments slender, branched, intricate, colored, forming minute, subconfluent, bright orange or scarlet-colored tufts; asci numerous, subglobose, produced among the filaments, .0004—.0006 in. long; spores orbicular, .00016—.0002 in. broad, crowded in the ascus, colorless, generally uninucleate.

PECK, CHAS. H.—“Report of the Botanist” in 36th An. Rep. N. Y. State Mus. of Nat. Hist.

This Report, (for 1883) of twenty-one pages, continues the account of the New York species of *Agaricus*. In the 35th, Report a key and descriptions of the species of *Lepiota* were given, and in this number the species of *Psalliota* are similarly treated. One species is new to the literature of science, namely *Agaricus Rodmani*, Peck. It is intermediate between *A. campestris* and *A. arvensis*, resembling the former in shape and size of the pileus, and the latter in color of the pileus and the lamellæ.

CRAGIN, F. W.—“First contribution to the Catalogue of the Hymenomyces and Gasteromycetes of Kansas;” in Bull. Washburn College Laboratory Nat. Hist., p. 33, continued from p. 28.

Of the forty-eight species enumerated, the following are proposed as new: *Phallus collaris*, Cragin; *P. purpuratus*, Cragin; *Simblum rubescens*, Gerard, var. *Kansensis*, Cragin; *Lycoperdon rubro-flavum*, Cragin; *L. tabacinum*, Ellis; *L. sigillatum*, Cragin; *L. rima-spinosum*, Cragin; *L. molle*, Pers., var. *occidentalis*, Cragin; *Geaster turbinatus*, Cragin; and *Bovista cinerea*, Ellis.

CRAGIN, F. W.—“Second contribution to the catalogue of the Hymenomyces and Gasteromyces of Kansas;” l. c. p. 65.

A list of twenty determined species is given in this paper one of which is new, as follows:

CORTICIUM VELLEREUM, Ellis & Cragin.—Dirty white, texture loose, floccose, margin byssoid. Spores abundant, globose, 4–5 μ in diameter, borne on short, stout, sub-clavate basidia.

CRAGIN, F. W.—“A New Genus and Species of Tremelline Fungus.” l. c. p. 82.

“*CERACEA*, Cragin.—Fungi waxy (at first gelatinous?), very thin, investing the host as with a varnish; sporophores borne on the ends of the filaments, mostly bifurcate, each ramus bearing a single non-septate spore. Blending characters of *Dacrymyces*, *Tremella*, and *Hymenula*.”

“For the species, *Ceracea vernicosa*, Cragin, may be added the following: Translucent to opaque, becoming brown, and then here and there blackish, spores elliptical and apparently formed by constriction from the apices of the basidia.

“The plant was found completely clothing immature specimens of *Polyporus*.”

ERRATA.

Journal of Mycology, Vol. I, p. 6, in second line of description of *Ramularia Astragali*, omit “(3–6 mm.);” and in third line below, for “8–4 μ ” read 3–4 μ .

On same page, ninth line from the bottom, for “spores” read sent.

In some copies, the last sentence on p. 39 is defective. It should read as follows:

Conidia oblong or cylindrical, 1–3 septate, colorless, 20–30 \times 7–8 .

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ENUMERATION OF THE NORTH AMERICAN CERCOSPORÆ.

WITH DESCRIPTIONS OF THE SPECIES.

BY J. B. ELLIS AND BENJAMIN M. EVERHART.

105. *CERCOSPORA RETICULATA*, Pk. 34th Rep. N. Y. State Mus., p. 47 (with figs.)

Spots large, irregular, brown. Hyphæ amphigenous, short, tufted. nearly colorless. Conidia numerous, very variable in length, bacillary or subcylindrical, colorless. Conidia numerous, very variable in length bacillary or subcylindrical, colorless, 30—100 x 5—6 μ , with 3—7 septa.

The large spots sometimes occupy nearly half the leaf. They are dry and brittle. The pure white color of the fungus contrasts beautifully with the dark brown color of the spots. The conidia are usually more abundant along the veinlets than elsewhere, and thus give a reticulated appearance to the spots.

On leaves of *Solidago altissima*, Catskill Mts., N. Y., Aug., (Peck.)

106. CERCOSPORA GRISELLA, Pk. 33d Rep. N. Y. State Mus., p. 29.

"Spots suborbicular, indeterminate, yellowish. Hyphæ short, minutely tufted, septate. Conidia slightly thickened towards one end (below ?) or subfusiform, colorless, triseptate, 40—50 μ long. Living leaves of *Erigeron annuum*, July, N. Y. (Peck.) The tufts are so numerous and so minute as to give the under surface of the leaf the appearance of being suffused by a minute pruinosity."

Is this sufficiently distinct from *Cercospora cana* Sacc. ?

107. CERCOSPORA TOXICODENDRI, Ell. Am. Nat., Oct. 1882, p. 811.

Tufts snow white on black spots (1—2 mm). Hyphæ short, 25—30 x 5½ μ , pale brown. Conidia slender obclavate, faintly multiseptate, hyaline, attenuated above, 50—60 x 5—6 μ .

On leaves of *Rhus Toxicodendron*, Newfield, N. J. Not since found, and hence doubtful.

108. CERCOSPORA APOCYNII, E. & K. Bull. Tor. Bot. Club, XI, p. 121

Amphigenous, on small (1—3 mm.) brown spots with a narrow raised border; often occupying only a small (1 mm.) circular area on the brown spots, or sometimes several small white patches of conidia on the same spot. Hyphæ very short, 16—20 x 2.5 μ , tufted, hyaline, simple, entire. Conidia narrow-cylindric, 45—60 x 2.5 μ , granular and becoming faintly 3—4-septate.

The spots are at first purplish brown, with a purplish border, but become rusty brown except where whitened by the conidia.

On leaves of *Apocynum*, Aug., Kansas (Kellerman.)

C. Species standing ambiguously between CERCOSPORA and RAMULARIA.

(The species originally intended to be placed here will be included in the enumeration of the species of RAMULARIA.)

The following species were received too late for classification.

(109.) CERCOSPORA LEPIDII, Pk. 35th Rep. N. Y. State Mus.

Spots small, orbicular, grayish-brown or subcinereous, usually marked with faint concentric lines. Hyphæ amphigenous, about 35 μ long, single or two or three in a cluster, pallid. Conidia very long, tapering upwards, slightly constricted at the septa, eight to nine-septate, 150—200 μ long 20—25 μ wide in the widest part, greenish.

On living leaves of *Lepidium campestre*, May, N. J. (Peck.)

This is a very singular species. The fungus occurs on both sides of the leaf, but is more abundant on the upper side. The hyphæ are short and thick, and occasionally branched. The septa occur in the broad part of the spore, the upper part being much narrowed. Occasionally a cell is divided by a longitudinal septum.

(110.) CERCOSPORA DATURÆ, Pk. 35th Rep. N. Y. State Mus.

Spots suborbicular or irregular, varying in color from cinereous to reddish-brown, sometimes marked by irregular or flexuous elevated lines.

Hyphæ amphigenous, scarcely tufted, about equaling the length of the conidia, which are rather large, narrowed upwards, greenish, four to six-septate, 55—80 μ long, about 12 μ broad in the widest part.

On living leaves of *Datura stramonium*, June, N. Y. (Peck.)

(111.) CERCOSPORA LONGISPORA, Pk. 35th Rep. N. Y. State Mus.

Spots suborbicular, sometimes confluent and irregular, grayish-brown, the margin slightly darker. Hyphæ amphigenous, sometimes epiphyllous only, tufted, 20—40 μ long, colored. Conidia very long, variously curved or flexuous, colorless, simple or obscurely septate, sometimes forked, 60—170 μ long, about 4 μ broad.

On living leaves of *Lupinus perennis*, July, N. Y. (Peck.)

The species is apparently very distinct from *C. Lupini*, Cke., and is well marked by its densely tufted, black hyphæ and its very long, hyaline conidia.

(112.) CERCOSPORA VARIA, Pk. 35th Rep. N. Y. State Mus.

Spots suborbicular, sometimes large and irregular, reddish-brown, with a darker margin, reddish-gray beneath. Hyphæ few, hypophyllous, tufted, short, slightly colored. Conidia subcylindrical, one to five-septate, sometimes multinucleate, 40—70 μ long.

On living leaves of *Viburnum acerifolium*, July, N. Y. (Peck.)

A form of this species occurs on *Viburnum Lentago*. In it the spots are brown and the hyphæ are shorter. Doubtfully distinct from *C. tineæ*, Sacc.

(113.) CERCOSPORA COMARI, Pk. 35th Rep. N. N. State Mus.

Amphigenous but more perfectly developed below. Hyphæ elongated, 150—200 \times 3—4 μ , continuous or with an occasional septum, geniculate and bent above, reddish-brown, collected in little fascicles which appear under the lens like a thin, erect, brown pubescence. Conidia clavate, dark brown, about 5-septate, sometimes constricted at the septa, 40—60 \times 6—8 μ . The fungus first appears in little brown patches (not on definite spots) which soon become darker and spreading, become confluent and blacken the greater part of the leaf.

On *Potentilla palustris*, New York (Peck.)

(114.) CERCOSPORA ALISMATIS, Ellis & Holway, n. s.

Spots indefinitely limited, brown, becoming whitish or gray in the center, of irregular shape, $\frac{1}{4}$ —1 cm. Hyphæ tufted, epiphyllous, dark brown, continuous, abruptly bent, subnodulose and subdentate above, 50—75 \times 5—6 μ . Conidia hyaline, slender, gradually attenuated above, 5—9 septate 60—120 \times 3—4 μ .

On *Alisma Plantago*, Decorah, Iowa, July (Holway.)

(115.) CERCOSPORA PERSONATA, (B. & C.) (*Cladosporium personatum* B. & C. Grev., III, p. 106.)

Forming small brown, orbicular spots (2—4 mm.) on the lower surface of the leaves. Hyphæ densely tufted, short, brown, continuous. Conidia mostly clavate, pale brown, about 3-septate, 30—50 \times 5—6 μ . Originates beneath the epidermis.

On leaves of *Arachis hypogæa*, Carolina and Alabama (Ravenel.) According to Berkeley (l. c.), "a variety occurs on *Cassia occidentalis* which, amongst the usual threads has others which are slender, articulated, with longer oblong 1-septate spores,"

(116.) *CERCOSPORA SIMULATA*, Ellis & Everhart, n. s.

Hypophyllous, forming olive brown patches $\frac{1}{2}$ —1 cm. across. Tufts effused. Hyphæ fasciculate, dark brown, slender, undulate and crisped above, 150—200 x 3 μ , septate. Conidia oblong or clavate-oblong, brownish, about 3-septate, 20—45 x 4—5 μ . Has longer, darker hyphæ and shorter conidia than *C. olivacea* (B. & C.), and differs also from *C. effusa* (B. & C.)

On leaves of *Cassia Marylandica*, Pine Hills, Ills. (Earle.)

ALPHABETICAL LIST OF HOST-PLANTS.

(The reference after each name is to the serial number in the preceding descriptions.)

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Amorpha canescens (*C. passaloroides*, Winter) 73.

Ampelopsis quinquefolia (*C. Ampelopsidis*, Pk.) 98.

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Apios tuberosa (*C. tuberosa*, E. & K.) 54.

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Asclepias Cornuti (*C. Asclepiadis*, Ell.) 8.

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Asclepias obtusifolia (*C. clavata*, Gerard) 96.

Baptisia (*C. velutina*, E. & K.) 82.

Beet leaves (*C. beticola*, Sacc.) 12.

Bœhmeria cylindrica (*C. Bœhmeriæ*, Pk.) 51.

Calla palustris (*C. Callæ*, Pk. & Clinton) 21.

Callicarpa (*C. Callicarpæ*, Cke.) 70.

Callirrhoe (*C. althæina*, Sacc.) 56.

Cassia obtusifolia (*C. nigricans*, Cke.) 84.

Cassia Marylandica (*C. simulata* E. & E.) 116.

Cassia occidentalis (*C. occidentalis*, Cke.) 74.

Caulophyllum thalictroides (*C. Caulophylli*, Pk.) 62.

Celery—cultivated (*C. Apii*, Fres.) 50.

Cephalanthus occidentalis (*C. Cephalanthi*, E. & K.) 24.

Cercis Canadensis (*C. cercidicola*, Ell.) 49, (*C. chionea*, E. & K.) 102.

Chenopodium album (*C. Chenopodii*, Fres.) 4.

Clematis (*C. rubigo*, Cke. & Hark.) 64.

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Lupinus diffusus (C. *Lupini*, Cke.) 99.
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SYLLOGE--VOLUME III.

Saccardo—*Sylloge Fungorum omnium hucusque cognitorum*, Vol. III, *Sphaeropsidæ*, *Melanconiceæ*, has at length appeared. The volume of 860 pages contains descriptions of 4,212 species, divided into 165 genera, of which *Phoma* embraces 632 species: *Septoria*, 581; *Phyllosticta*, 345; *Diplodia*, 264. As in the two preceding volumes, the fundamental principle of classification is based on the color, shape and septation of the spores. The application of the carpological system of classification to these families of fungi does not appear to have broken up and disarranged the old established genera to so great an extent as in the *Pyrenomycetes*, though various changes of more or less importance are to be noted. For instance, the *Hendersonias* with hyaline spores are made to constitute a new genus, *Staganospora*, Sacc., separated from *Hendersonia* by six intervening genera.

Sphaeronema, in the family *Sphaeroideæ*, is made to include only those species with membranaceous, coriaceous or carbonaceous perithecia and ovoid or oblong, continuous, subhyaline spores, while those with very thin, soft, membranous, bright-colored perithecia, with ellipsoid, continuous, hyaline spores, are placed in a new genus, *Sphaeronemella*, Sacc., belonging to another family. *Nectroideæ*, Sacc., and those with conic or spiniform, black perithecia and filifusoid, continuous, hyaline spores, make the genus *Sphaerographium*, Sacc., and those with perithecia bulbous at the base or equal, round or subclavate and spores fusoid-bacillary, generally falcate, septate, hyaline or yellowish, make the genus *Cornularia* (Karst.).

On page 442 we find *Lichenopsis sphaeroboloides*, Schw. This was doubtless an oversight, as this is now known to be an ascigerous fungus, with long, filiform, multiseptate spores, and the reproduction of the original description of Schweinitz in this place without comment would be apt to mislead. The true character of this fungus is given in Grevillea, IV, p. 7, and specimens have been distributed in the North American Fungi, No. 453. It is announced that Vol. IV of the Sylloge will contain the *Hypophomycetes*, and will appear before the end of 1885, and also that the *Sylloge Hymenomycetum* now being prepared by Prof. Saccardo and Prof. Jos. Cuboni will appear, at least the first part, this year.

The Sylloge is certainly a very valuable work, and may be considered almost a necessity for all who aspire to a thorough knowledge of the fungi. Of course, if the author could have given us a thorough re-elaboration of the species, in this and the preceding volumes, showing which were worthy to stand and which were to be rejected, or reduced to synonyms, the work would have been still more valuable; but this was not the original scope of the undertaking, and would have required an amount of time and careful research (if carried through all the orders of fungi) for which a single lifetime would hardly suffice, and we are glad Professor Saccardo has been able to give us the Sylloge, even such as it is, and hope he may meet with such support as may enable him to go on and finish up the work.

J. B. E.

Newfield, N. J., Feb. 11, 1885.

ON RAMULARIA OBOVATA, FCKL.,

Sym. Mycol. p. 103.

BY J. B. ELLIS AND BENJAMIN M. EVERHART.

The specimens of this species distributed in the NORTH AMERICAN FUNGI afford the following characters :

Spots orbicular, 2—8 mm., reddish brown with a dirty white center and a darker colored, narrow, sometimes slightly raised border, around which the leaf is at first purplish. Hyphæ amphigenous but mostly hypophyllous fasciculate, hyaline, continuous, very rarely with 1—2 septa, nearly straight, but often undulate, subdenticulate above, $70-125 \times 3-4 \mu$. Conidia terminal, obovate, granular, without septa, $18-25 \times 8-11 \mu$.

Specimens of *R. obovata*, Fckl. in Rabh. Winters' Fungi Europæi, agree well with the above description, but specimens collected on *Rumex crispus*, in Ohio, by Dr. W. A. Kellerman, June, 1883, and which at the time were referred to this species, differ in several particulars. The spots are larger and of a dirty gray color, without any white center. The hyphæ are shorter ($40-60 \mu$) and not undulate, and the conidia vary from oblong-clavate to cylindrical, and are, as a rule, uniseptate, occasionally 2—3 septate. Cylindrical is the prevailing form, slightly constricted at the septum, agreeing, in fact, very well with those of specimens on *Rumex* collected at Wood's Holl, Mass., by Dr. W. G. Farlow, and mentioned by him in Bulletin of the Bussey Inst., 1877, pp. 236 and 237, and in Proc. Am. Acad. 1878, p. 262, as probably referable to *Ramularia obovata*, Fckl., or *R. macrospora*, Fres., of which the first mentioned species is there regarded as a probable synonym. In preparing the list of *Ramularias*, we have found among our European specimens only one fruitful specimen of *R. obovata*, Fckl., viz., the one in Fung. Eur. already referred to. The specimen in Mycotheca Marchica, no. 493, afforded us neither hyphæ nor conidia, and on two specimens from Von Thuemen we could find no conidia. We find, however, in Hedwigia, June, 1883, a paper by Professor C. A. J. A. Oudemans on the "Identity of *Oidium monosporium*, West., *Peronospora obliqua*, Cke., and *Ramularia obovata*, Fckl.," in which the Professor states that he has examined specimens of *R. obavata*, Fckl., distributed under different names in various European collections, viz., Fckl.'s Fungi, Rhenani, Cooke's British Fungi and Saccardo's Mycotheca Veneta, and finds them all agreeing with the description given by Fuckel of his *Ramularia obovata*, the obovate $20-25 \times 10-12 \mu$ conidia being constantly without septa and borne on generally simple and continuous undulate hyphæ. Prof. Oudemans also states that he examined fresh, living specimens and found them all to agree with the dried specimens and with the description of the species in question given by Fuckel. The constant invariability of the European specimens would

lead to the suspicion that there may be some error in the conclusions arrived at by Dr. Farlow in referring to *R. obovata*, Fckl., the Massachusetts specimens on *Rumex*, investigated by him and having the "mature spores long and narrow with 1—3 septa." We must either suppose that *R. obovata*, Fckl., is more variable in this country than in Europe, or that two species have been confounded. The latter appears to us the more reasonable conclusion, which is further strengthened by the fact that in examining the material furnished by Dr. Farlow (for N. A. F. no. 220), of which a part is still in our hands, one leaf was found agreeing in all respects with the Ohio specimens, while all the others afforded only the obovate spores without septa. As a further confirmation of the correctness of this conclusion is the fact that on the specimen in Rabh.-Winter's; F. Eur., no. 2885, one of the obovate spores was seen in a state of germination, but still without any trace of a septum.

Considering it, then, highly probable, and in fact almost certain, that the Ohio *Ramularia* is not the *R. obovata* described by Fuckel and distributed in the various European Exsiccati referred to, we have still to consider whether, as Dr. Farlow has suggested in the papers already mentioned, this is really a form of *R. macrospora*, Fres. The fact that the fungus described by Fresenius under the name of *Ramularia macrospora* was found on a species of *Campanula* would lead us to suspect that our fungus on *Rumex* might be different. In *R. macrospora*, Fres., the hyphæ are, according to that author, 1—2 septate below and the conidia generally not septate, while in the Ohio specimens the hyphæ are, so far as we can see, without septa, and the conidia, as a rule, 1-septate. Whether the conidia are concatenate we are uncertain, but the fact that they show the scar marking the point of attachment only at one end, would indicate that they are not, though two or three conidia were seen with a knob at one end which might indicate either the formation of a second spore or the commencement of germination. Fresenius does not say whether his *R. macrospora* is on spots but Saccardo, in his *Fungi Italici* 1003 thus figures it, though the hyphæ in his figure are without septa. Unfortunately we have no authentic specimen of *Ramularia macrospora*, Fres., to enable us to decide the matter definitely, and meanwhile we here characterize the Ohio specimens under a separate name, as follows:

RAMULARIA DECIPIENS, E. & E.

Spots orbicular, gray, $\frac{1}{4}$ — $\frac{1}{2}$ cm., with a darker colored, narrow, raised border. Tufts amphigenous, scattered, whitish. Hyphæ fasciculate, issuing in dense clusters through the stomata of the leaf, hyaline, continuous, nearly straight, entire or subdenticulate above, 30 — $50 \times 3 \mu$. Conidia clavate-oblong or simply oblong or more commonly cylindrical, 1-septate and mostly slightly constricted at the septum, exceptionally 2 or 3-septate, 15 — 35×6 — 8μ , ends obtusely rounded.

On leaves of *Rumex crispus*, Fairfield Co., Ohio, June 1883 (Kellerman).

NEW LITERATURE.

BY W. A. KELLERMAN.

HARKNESS, H. W. "Fungi of the Pacific Coast;" in Bulletin of the California Academy of Sciences, Feb. 1885.

Of the long list of species the following are described as new: *Polyplocium Californicum*, Hk.; *Lycoperdon sculptum*, Hk.; *Septogonium defolians*, Hk., on *Quercus Kelloggii*; *Sorosporium Californicum*, Hk., in heads of *Grindelia*; *Dicranidium fragile*, Hk., on decaying *Nerium Oleander*; *Chalara setosa*, Hk., on dead leaves of *Quercus densiflora*; *Cercospora glomerata*, Hk., on living leaves of *Garrya elliptica*; *Tetraploa scabra*, Hk., on *Scirpus*; *Plowrightia phyllogona*, Hk., on leaves of *Amelanchier alnifolia*; and *Geopora Cooperi*, Hk. Two new genera are diagnosed as follows:

DICRANIDION, Hk. (Etym. *Dikranos*, a fork.)—Acervuli pale, scattered. Spores hyaline, septate, shaped like a tuning-fork, attached by the closed extremity to short branching hyphæ.

D. FRAGILE, Hk.—Acervuli, rosy-white, minute, scattered; spores hyaline, 4-septate, shaped like a tuning-fork, attached by the closed extremity, easily separating, each arm dividing near the centre and near the base, forming one rounded and four oblong segments; length of spore 12–16; width of arm 4–5 μ . On decaying *Nerium Oleander*, Feb. Cal. In appearance much like *Fusarium*.

GEOFORA, Hk. (Etym. *Ge*, the earth, and *opora*, Autumn fruits.) Subterranean. Integument woolly, continuous with the trama. Hymenium convolute. Asci cylindrical. Sporidia hyaline, oblong, smooth.

G. COOPERI, Hk.—Irregularly globular, 2–4 cm. in diameter, covered with dense brown wool, which is continued inwards on the trama; absorbing base none; hymenium white, not closely packed; asci cylindrical, 8-spored, 220 x 26 μ ; sporidia hyaline, oblong, smooth, with a large, shining excentric, nucleus, 28 x 20 μ . Belonging to the Tuberacei, allied to *Hydnootrya*, but sporidia oblong and smooth.

KELLERMAN, W. A.—"A Partial List of the Kansas Parasitic Fungi, together with their Host-plants;" presented to the Kansas Academy of Science, Nov. 25, 1884, and reprinted in Bull. Wash. Coll. Laboratory of Nat. Hist., p. 72.

The species were collected in 1883 and 1884, numbering about one hundred and eighty. No descriptions are given (except of *Septoria Kellermaniana*, Thuem. n. s. *Sporis bacillaribus, rectis, tenuissimis, simplicibus, vel vix visibile septatus, 60–80 x 1.5 μ .*) A list of the host plants is given, arranged alphabetically. The genera most numerously represented are *Puccinia* with nineteen species, *Septoria* with nineteen, *Phyllosticta* with thirteen, *Cercospora* with thirty-three, and *Ramularia* with eight species. *Puccinia Malvacearum*, Mont., is here reported from the Arkansas Valley, as occurring on *Malvastrum coccineum*. According to Mr. Arthur (see p. 27) it had not been reported in the United States.

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No. 6.

NORTH AMERICAN SPECIES OF RAMULARIA.

WITH DESCRIPTIONS OF THE SPECIES.

BY J. B. ELLIS AND BENJAMIN M. EVERHART.

RAMULARIA, closely allied to *Cercospora*, and having the same general characters and mode of growth as that genus, is distinguished by its hyaline (colorless) hyphæ and conidia. The conidia (spores) are also often concatenate, *i. e.* produced in series or chains, one above the other, and attached to each other by their contiguous ends. They also vary considerably in shape, from nearly globose to ovoid, oblong or cylindrical, but are not prolonged or attenuated above as is usual in *Cercospora*. This, in fact, is the only character separating them from the *Cercosporas* with hyaline hyphæ (*Cercosporella*, Sacc.) The *Ramularias* with globose or ovoid conidia, are separated by Saccardo under the name *Ovularia*, but we have here included them all under *Ramularia*. The species are all biogenous, *i. e.* growing on *living* plants, mostly on the leaves, often on definite spots on the leaves. The mycelium spreading through the intercellular spaces of the leaf, sends out through the stomata, the fertile hyphæ at the extremities of which the conidia are produced. Conidia also, or oftener the scars that mark the place of their attachment after the conidia themselves have fallen, are seen along the sides of the fertile hyphæ, but this generally arises from the fact that the growth of the hypha is not arrested with the formation of the first terminal spore, but pushes its apex obliquely by the spore which thus becomes lateral, another terminal spore being formed above the first and generally on the opposite side of the hypha, and this process may be several times repeated, the hypha becoming thus abruptly bent this way and that

(geniculate) something like the rachis in a head of wheat. When the hyphæ have reached the limit of their elongation their apices often become slightly enlarged and bear 2—3 conidia standing nearly side by side.

The species may be arranged as follows:

A. CONIDIA OBLONG OR CYLINDRICAL.

- a. Spots white or gray, 1—11.
- b. Spots brown or brownish, 12—30.
- c. Spots indefinite or none, 31—35.

B. CONIDIA OVATE.

- a. *Conidia continuous*, (*Ovularia*, Sacc.) 36—39.
- b. *Conidia uniseptate*, 40.

A. CONIDIA OBLONG OR CYLINDRICAL.

- a. Spots white or gray.

1. *RAMULARIA AQUATILIS*, Pk. 35th Rep. N. Y. State Mus., p. 142.

Spots small, pale. Hyphæ epiphyllous, tufted, very slender, short, flexuous, hyaline. Conidia subfiliform, narrowed toward one end, sometimes 3—4 nucleate, colorless, $20-30 \times 2\frac{1}{2}-3 \mu$.

On living leaves of *Potamogeton lonchites*, Sept., Albany, N. Y. (Peck.)

The tufts are numerous, very small and white. When magnified they have a stellate appearance, the conidia diverging like rays.

2. *RAMULARIA PRINI*, Pk. (ined.)

Amphigenous, on suborbicular, white, definitely limited spots (2—3 mm.), and mostly surrounded with a purplish discoloration. Hyphæ fasciculate, simple, entire or faintly denticulate above, $12-20 \times 2\frac{1}{2} \mu$. Conidia oblong-cylindrical, continuous, of about the same dimensions as the hyphæ.

On leaves of *Prinos* (*Ilex verticellata*), Casoga, N. Y., July (Peck.)

In the specimens received from Peck, the *Ramularia* was accompanied by a *Cladosporium* with scattered brown hyphæ $50-70 \mu$ long.

3. *RAMULARIA DIERVILLÆ*, Pk. (ined.)

Hypophyllous, on small, round, white spots, 2—3 mm. in diameter, with a narrow, slightly raised, dark colored border. Conidia cylindrical, continuous or faintly septate, borne on short, fasciculate hyphæ.

On living leaves of *Diervilla trifida*, Adirondack Mts., N. Y. (Peck.)

4. *RAMULARIA CELASTRI*, E. & M. Am. Nat. Dec. 82, p. 1005.

Spots small, white, border dark brown. Hyphæ subhyaline, fasciculate, $24 \times 3 \mu$. Conidia oblong-cylindrical, hyaline, guttulate, uniseptate, $18-21 \times 3 \mu$.

On leaves of *Celastrus scandens*, Pennsylvania (Martin), Kansas (Kellerman), Wisconsin (Trelease), who finds the conidia 1—4 celled. *R. Celastri*, Pk. in 33d Rep. is the same.

5. *RAMULARIA PLANTAGINIS*, E. & M., l. c.

Spots small, round, whitish, border reddish brown. Hyphæ fascicu-

late, continuous, hyaline, subgeniculate, equal, $35-40 \times 3-3\frac{1}{2} \mu$, simple or subramose, tips acute or obtuse. Conidia cylindrical, 1—2-septate, $15-38 \times 4 \mu$, with ends rather obtusely rounded.

On leaves of *Plantago major*, New Jersey to Kentucky (Kellerman) and Wisconsin (Trelease.)

6. RAMULARIA CELTIDIS, E. & K. n. s.

Amphigenous, on small (1—2 mm.), round spots with a thin, white center, and a brown margin limited by a well-defined, narrow, slightly raised line. Hyphæ very short ($5-8 \times 2\frac{1}{2} \mu$), entire, hyaline, growing in little tufts which appear like a fine, white powder sprinkled over the spots. Conidia nearly cylindrical hyaline, straight or slightly curved, 1—3 septate, $25-50 \times 2-2\frac{1}{2} \mu$.

On leaves of *Celtis occidentalis*, Sept., Kansas (Kellerman.) Approaches Cercospora.

7. RAMULARIA TULASNEI, Sacc. Mich. I, p. 536.

Spots grayish white with a broad, red-shaded border. Hyphæ fasciculate, hyaline, simple, $30-40 \times 3 \mu$. Conidia cylindrical, continuous or 1—2-septate, hyaline, $20-35 \times 2\frac{1}{2}-4\frac{1}{2} \mu$.

On leaves of *Fragaria*, throughout the country.

Mr. F. S. Earle has given a minute account of the injury done by this parasite to the cultivated strawberry, in a paper read at the annual meeting of the Miss. Valley Hort. Soc. at New Orleans, Jan. 1885. Prof. Trelease, in his Prelim. List of the Parasitic Fungi of Wisconsin (1884) remarks that this fungus appears to pass the winter in black, stromatoid sclerotia which protrude from the surface of the leaf, and that in the spring, conidial threads grow out of these bodies and quickly fruit. He also gives *R. Fragariæ*, Pk. in 34th Rep. as a synonym of this.

8. RAMULARIA ARVENSIS, Sacc., Mich. II. p. 548, Fungi Ital. tab. 1000.

Spots suborbicular, whitish, minute, with a red border. Hyphæ epiphyllous, fasciculate, subsimple, continuous hyaline, denticulate. Conidia cylindrical or continuous, 1-septate, $22-26 \times 2\frac{1}{2}-4 \mu$, briefly catenulate, hyaline.

On *Potentilla Norvegica*, Ohio (Kellerman), Wisconsin (Trelease), New Hampshire (Farlow).

9. RAMULARIA ARMORACIÆ, Fckl. Symb. Myc., p. 361.

Tufts loose, white, on dry, orbicular spots. Hyphæ fasciculate, simple. Conidia cylindrical, subventricose, simple (continuous), hyaline, $22 \times 5 \mu$.

On leaves of *Nasturtium Armoracia*, N. Y. (Peck), Wisconsin (Trelease), Kansas (Kellerman).

10. RAMULARIA URTICÆ, Ces. (in Rab. Herb. Mycol. 1680).

Spots gray, small, 1—3 mm., indefinite, thickly scattered over the leaf and visible on both sides. Hyphæ hypophyllous, loosely fasciculate, subeffused, hyaline, continuous, $30-40 \mu$ long, subdenticulate above, often with one or more lateral "knee-like projections" above (incipient

branches?) and with tips subacute, or obtuse. Conidia varying from acutely elliptical, $6-10 \times 2\frac{1}{2}-3 \mu$ to narrow cylindrical, $15-25 \mu$ long, continuous or rarely 1-2 septate, concatenate, the chains of spores often branching. This last character is (as Fresenius remarks) easily recognizable, even in single isolated spores in which, particularly the longer, cylindrical ones which form the lower part of the chain, a little lateral globose sphere is often seen just below the apex, being, in fact, the commencement of a new chain or branch. The author last cited also remarks that the hyphæ with obtuse tips show 2-5 scars marking the point of attachment of as many spores. In the Iowa specimens we have seen hyphæ with at least three of these scars on a single tip.

On leaves of *Urtica gracilis*, Wisconsin (Trelease), Iowa (Holway).

11. *RAMULARIA EUONYMI*, E. & K., Jour. Mycol., I, 3.

Amphigenous, on dirty white spots, 2-3 mm. in diameter, with a dark but scarcely raised border. Hyphæ arising from a tubercular base, cæspitose, hyaline, simple and subentire or slightly toothed above; conidia concatenate, oblong-cylindrical, mostly 1-septate, (occasionally 2-3 septate) hyaline, $20-25 \times 3 \mu$. Accompanied by minute, black, immature perithecia scattered over dead parts of the leaf, the whole being probably the conidial and pycnidial stage of some *Sphaerella*. This has much the same general appearance as *Cercospora Euonymi*, Ell., but the spots are larger and more irregular in shape without any distinct colored border, and the character of the conidia show it to be quite distinct from that species.

On leaves of *Euonymus atropurpureus*, Oct., Kansas (Kellerman.)

b. Spots brown or brownish.

12. *RAMULARIA HAMAMELIDIS*, Pk., 35th Rep. N. Y. State Mus., p. 141.

Spots small, angular, reddish brown, a little paler on the lower surface. Hyphæ hypophyllous, tufted, short, slightly colored. Conidia fusiform or oblong-cylindrical, colorless, $12-35 \mu$ long.

On living leaves of *Hamamelis Virginica*, July. Tufts very minute, scarcely visible to the naked eye. N. Y. (Peck.)

13. *RAMULARIA RUDBECKIÆ*, Pk., 34th Rep. N. Y. State Mus., p. 47.

Spots variable in size, frequently confluent, angular, included by the veinlets, brown. Hyphæ hypophyllous, tufted, short. Conidia subcylindrical, rounded at the ends, colorless, $30-50 \mu$ long, sometimes concatenate and obscurely septate.

On living leaves of *Rudbeckia laciniata*, Catskill Mts., N. Y. (Peck.)

14. *RAMULARIA IMPATIENTIS*, Pk., l. c.

Spots few, suborbicular, reddish brown, the margin subindeterminate. Hyphæ very short and inconspicuous, $10-15 \times 3-4 \mu$, oblong or clavate, denticulate above. Conidia epiphyllous, oblong, subacute, granular, $15-22 \times 4 \mu$. The tufts or hyphæ are very minute and appear like a fine, white mould on the brown spots.

On *Impatiens fulva*, N. Y. (Peck.)

15. RAMULARIA RUFO-MACULANS, Pk. l. c.

Spots numerous, often confluent and occupying nearly the whole leaf. dull red. Hyphæ very short, hypophyllous, tufted. Conidia concatenate, variable, elliptical oblong or cylindrical, colorless. $8-16 \times 3-4 \mu$.

Living leaves of *Polygonum amphibium*, var. *terrestre*, Sept., Albany, N. Y. (Peck), Kansas (Kellerman.) Sometimes the spots have a paler or greenish yellow margin, and, when they are abundant and confluent, the leaf presents a dingy red hue. Closely allied to *R. Bistortæ*, Fekl.

16. RAMULARIA SAMBUCINA, Pk. l. c.

Spots small, orbicular, scattered, pallid or reddish brown, surrounded by a blackish-brown border. Hyphæ hypophyllous, tufted, short, irregular above, colorless. Conidia oblong or subcylindrical, slightly narrowed at the extremities, colorless, $20-35 \times 5-7 \mu$, sometimes concatenate, rarely uniseptate.

On living leaves of *Sambucus Canadensis*, Catskill Mts., N. Y. (Peck.)

17. RAMULARIA ANGUSTATA, Pk. (ined.)

"Spots small, orbicular, sometimes confluent, pale greenish-yellow. frosted beneath by the fungus. Hyphæ minute. Conidia narrowly fusiform or subcylindrical, $7-10 \times 2\frac{1}{2} \mu$, often containing two or more nuclei.

On living leaves of *Azalea nudiflora*, June." N. Y. (Peck.)

18. RAMULARIA MIMULI, E. & K., Am. Nat. Nov. 1833, p. 1166.

Spots suborbicular, $\frac{1}{4}-\frac{1}{2}$ cm., with a dark, shaded border which is more conspicuous above. Hyphæ mostly hypophyllous, subfasciculate, continuous, subhyaline, $30-50 \times 3 \mu$. Conidia cylindrical, hyaline, uniseptate, $30-40 \times 3 \mu$.

On leaves of *Mimulus ringens*, Kansas (Kellerman.) Closely allied to *R. Phyteumatis*, Sacc. & Winter.

19. RAMULARIA ORONTII, E. & M., Am. Nat., Feb, '84, p. 189.

Spots large, pale brown, border darker. Hyphæ epiphyllous, $30 \times 3 \mu$, apices mostly bifid. Conidia hyaline, oblong with the ends subacute. uniseptate, abundant, $18 \times 4 \mu$.

On leaves of *Orontium aquaticum*, Newfield, N. J.

20. RAMULARIA ANDROMEDÆ, E. & M., l. c.

Hypophyllous, forming dull white orbicular patches about 1 cm. in diameter, with a red-brown spot of the same extent on the opposite side of the leaf. Hyphæ simple or branched, continuous, $30-40 \times 3 \mu$. Conidia oblong or cylindrical, continuous or uniseptate, $10-20 \times 1\frac{1}{2}-2 \mu$.

On leaves of *Andromeda racemosa*, Newfield, N. J. *R. Vaccinii*, Pk. in 35th Rep., (on *V. corymbosum*, and *V. Pennsylvanicum*) does not appear to us to be distinct from this.

21. RAMULARIA VARIABILIS, Fekl. Symb. p. 361.

Spots dull brown, irregular, rather indefinitely limited (2-5 mm.), often abundant and confluent, giving the leaf a dead, withered look. Hyphæ amphigenous, fasciculate, simple, short ($8-12 \mu$). Conidia subconcatenate, variable, acutely elliptical, ovate, oblong or cylindrical, $8-22 \times 3-4 \mu$, ($18-22 \times 3-4 \mu$, Sacc.) mostly (in the specimens examined) less than 15μ long ($8-15 \mu$), the longer ones uniseptate.

On leaves of *Verbascum Thapsus*, Catskill Mts., N. Y. (Peck) and probably in other localities.

22. *RAMULARIA MITELLÆ*, Pk. 33d Rep. N. Y. State Mus., p. 30.

Spots suborbicular, brown. Hyphæ hypophyllous, minutely tufted, short, nearly straight, slightly colored. Conidia straight, oblong or cylindrical, colorless, unequal in length, $8-20 \times 3 \mu$.

On living leaves of *Mitella diphylla*." N. Y. (Peck.)

23. *RAMULARIA NEMOPANTHIS*, C. & P. 29th Rep. N. Y. State Mus., p. 52.

Spots brownish, darker above, indefinite. Hyphæ hypophyllous, fasciculate, short. Conidia fusiform or cylindrical, $20 \times 4 \mu$.

On leaves of *Nemopantes Canadensis*, N. Y. (Clinton), New Hampshire (Farlow).

24. *RAMULARIA BRUNNEA*, Pk., 30th Rep. N. Y. State Mus., p. 55.

Spots brown, unequal, suborbicular, sometimes confluent. Hyphæ occupying the larger spots and giving them an ashy tint, epiphyllous, short, delicate. Conidia cylindrical, colorless, very unequal in length, $12-40 \times 3\frac{1}{2} \mu$.

On living leaves of *Tussilago Farfara*, N. Y. (?) (Peck.)

We have seen no specimens.

25. *RAMULARIA ASTRAGALI*, Ell. & Hol. Jour. Mycol., I, p. 6.

Spots 2-4 mm., lead-colored below, brown above. Hyphæ hypophyllous, fasciculate, continuous or faintly septate, nearly hyaline, but with a faint yellowish tinge, undulate and subgeniculate, $80-112 \times 3-4 \mu$. Conidia oblong-elliptical, uniseptate, hyaline, $15-22 \times 7-9 \mu$.

On leaves of *Astragalus Canadensis*, Iowa (Holway.)

This, though allied to the preceding species is quite distinct on account of its large, differently colored spots and broader conidia, which, so far as we can see, are not concatenate.

26. *RAMULARIA OXALIDIS*, Farlow. Appalachia, III, p. 251 (1884).

Amphigenous, forming small, circular, blackish spots, with a light-colored center. Hyphæ hyaline, very numerous, densely packed together, $55-75 \times 3-4 \mu$, the shorter ones simple, the longer ones vaguely branching. Conidia hyaline, linear oblong, blunt pointed at both ends, $15-27 \times 3-4 \mu$, one celled but occasionally with an imperfect septum.

On *Oxalis acetosella*, New Hampshire (Farlow.)

27. *RAMULARIA ACTÆÆ*, Ell. & Hol. n. s.

Amphigenous but mostly hypophyllous, appearing at first in patches of irregular outline, limited partly by the veinlets of the leaf which soon becomes yellowish in the affected parts, then dark brown or nearly black, in irregular spots .2-.5 cm. across, with a sub-angular outline. Hyphæ fasciculate, continuous, hyaline, nearly straight, sparingly denticulate above, $25-35 \times 4-5 \mu$ (exceptionally $50-75 \mu$ long). Conidia oblong-cylindrical, nucleate and mostly 1-septate, $15-35 \times 3\frac{1}{2}-5 \mu$ (mostly $25 \times 5 \mu$).

On leaves of *Actæa alba*, Iowa, June (Holway). Allied to *R. didyma* Unger, but differs in its mostly shorter, straighter hyphæ and smaller oblong conidia.

28. *RAMULARIA DECIPIENS*, E. & E., Jour. Mycol. I, p. 70.

Spots orbicular, gray, $\frac{1}{4}$ — $\frac{1}{2}$ cm., with a darker colored, narrow, raised border. Tufts amphigenous, scattered, whitish. Hyphæ fasciculate, issuing in dense clusters through the stomata of the leaf, hyaline, continuous, nearly straight, entire or subdenticulate above, 30 — $50 \times 3 \mu$. Conidia clavate-oblong or simply oblong or more commonly cylindrical, 1-septate and mostly slightly constricted at the septum, exceptionally 2 or 3-septate, 15 — 35×6 — 8μ . ends obtusely rounded.

On leaves of *Rumex crispus*, Ohio, June 1833 (Kellerman.)

29. *RAMULARIA RANUNCULI*, Pk. 35th Rep. N. Y. State Mus., p. 141.

Spots suborbicular, scattered, brown. Hyphæ hypophyllous, tufted, colorless, subflexuous. Conidia oblong, sometimes narrowed towards one end, continuous or 1-septate, occasionally catenulate, colorless, 12 — 50×8 — 13μ .

On living leaves of *Ranunculus recurvatus*, West Albany, N. Y., June (Peck). We have seen no specimens, but should suspect this might be a form of *R. didyma*, Unger.

30. *RAMULARIA ULMARIÆ*, Cke., Grev. IV, p. 109. *R. Spirææ*, Pk. 34th Rep. N. Y. State Mus, p. 46.

"Tufts grayish-white, forming irregular, ovate or angular spots, mostly circumscribed by the veins. Flocci very short. Spores cylindrical, obtuse, simple, hyaline, 30 — $40 \times 7 \mu$." The above is copied from Grevillea, l. c.

The specimens in Rabh-Winter, F. Eu. 2887, have reddish-brown, sub-angular spots (1—3 mm.) with a narrow, reddish purple, slightly raised border, the center of the spots becoming, at length, dull white. Hyphæ in scanty tufts, short, continuous. Conidia oblong-fusiform or cylindrical, 12 — $30 \times 3 \mu$, the shorter ones simple or 1-septate, the longer ones 2—3-septate. Of Winter's specimens, those in envelope marked (a) have the spots more indefinite and surrounded with a broad, purple, shaded border, without any very distinct raised margin. We have seen no specimens of *R. Spirææ*. Pk., but, judging from the description, it seems to us better to place it as a synonym, at least till the question of its identity with *R. Ulmariæ*, Cke., can be decided from the examination of authentic specimens. It will be noted that Winter's specimens have the conidia mostly septate and narrower than stated by Cooke in Grevillea, and correspond well to the description of *R. Spirææ*, Pk., on *Spiræa opulifolia*.

c. *Spots none or indefinite.*

31. *RAMULARIA DESMODII*, Cke., Hedwigia, Mar. 1878, p. 39. *Fusidium Ravenelium*, Thuem., in Flora, (1878 no. 12.)

Hypophyllous, spots obsolete but leaves mottled with pale yellow above. Hyphæ forming irregular patches at first limited by the veinlets,

finally more or less confluent, hyaline, mostly simple, continuous or faintly 1—2 septate, subundulate and geniculate, $50-80 \times 3-4 \mu$, tips mostly obtuse and showing the marks of attachment of 2—3 conidia one of which is also borne at each lateral projection or knee as indicated by the scars. Conidia oblong, fusiform-oblong or clavate-oblong, mostly a little curved, 1-septate, rarely 2—3-septate, hyaline, $12-24 \times 3\frac{1}{2}-4 \mu$.

On leaves of various species of *Desmodium* from Carolina (Ravenel) to Iowa (Holway), Kansas (Kellerman) and Wisconsin (Trelease); var. *epiphylla*, on leaves of *Astragalus*, Wisconsin (Trelease), differs in its epiphyllous growth and the entire absence of any spots. It forms minute white, punctiform specks scattered rather sparingly over the leaf, and the conidia are perhaps a little larger and with a yellowish tint.

32. *RAMULARIA FILARIS*, Fres., Beitrag., p. 90.

Hypophyllous, whitish at first then yellowish, short ($15-25 \mu$), fasciculate, continuous, subgeniculate. Conidia oblong to cylindrical, concatenate, 1-septate, $12-30 \times 3\frac{1}{2}-4 \mu$. The upper surface of the leaf opposite the patches of hyphæ is pale yellowish at first, finally brown. There are no definite spots, the patches of hyphæ being at first limited by the areas formed by the veinlets of the leaf, but at length more or less confluent.

On living leaves of *Aster puniceus*, New Hampshire (Farlow). On leaves of *Aster*, Iowa (Holway). This appears to be the same as specimens in Kunze's *Fungi Selecti*, 498, but specimens in Rab. Winter, *Fungi Eur.* 3185, are amphigenous on quite pronounced dull greenish-brown spots, with shorter continuous conidia. Fresenius describes and figures the hyphæ (at least some of them) with a bristle-like prolongation above which we have not been able satisfactorily to make out, nor is this appendage figured by Saccardo in his *Fungi Italici*, 1004.

33. *RAMULARIA HERACLEI* (Oud.) Sacc. *Fungi Ven. Nov.* V., p. 187. *Cylindrosporium Heraclei*, Oud. *Mat. Fl. Mycol. Fland*, II, p. 301.

Epiphyllous, on brown, subangular, indefinitely limited spots (2—4 mm.) Hyphæ very short, hyaline. Conidia oblong-cylindrical, $18-30 \times 4-5 \mu$, the shorter ones 1-septate, the longer ones 3-septate and subattenuated above.

On leaves of *Heracleum lanatum*, Massachusetts (Farlow).

34. *RAMULARIA VIRGAUREÆ*, Theum. *Fungi Austriaci*, 1072.

Tufts effused, mostly hypophyllous, on pale, irregularly shaped, subangular areas of the leaf which shows yellow patches above (becoming brown). Hyphæ in small, compact tufts, hyaline, mostly short and entire but sometimes $60-75 \mu$ and denticulate above. Conidia cylindrical, 1-septate, $15-55 \times 4 \mu$ or elongated to $60-75 \mu$, and 3-septate, hyaline.

On living leaves of *Solidago*, from New Jersey to Kansas (Kellerman). This is certainly the same as the specimens in de Theumen's *Fung. Aust.* and in Kunze's *Fungi Selecti*. 398, though the specimens in both these collections show some conidia even longer than the N. J. or Kansas specimens.

This and the preceding species might with about equal propriety be referred to *Cercospora*.

35. RAMULARIA GRINDELLE, E. & K. Bull. Torr. Bot. Club, XI, p. 122.

Amphigenous, erumpent, punctiform. Hyphæ densely tufted, simple hyaline, nearly straight, $18-25 \times 3-4 \mu$. Conidia cylindrical, straight or slightly curved, hyaline, 1-2-septate, $20-40 \times 3-4 \mu$. The tufts of hyphæ ($150-200 \mu$ in diameter) are collected in little groups forming rusty-yellow specks thickly scattered over both sides of the leaf and finally whitening out.

B. CONIDIA OVATE.

a. *Conidia continuous*. (*Ovularia*, Sacc.)

36. RAMULARIA MONILIOIDES, E. & M., sub *Ovularia*, in Am. Nat., Jan. 1885, p. 76. *Ovularia Myricæ*, Pk. in literis.

On reddish-brown, round spots, 1-4 mm. in diameter. Hyphæ hypophyllous, fasciculate, hyaline sparingly septate and often branched above. $35-60 \times 3 \mu$. Conidia concatenate, 2-4 connected, obovate, hyaline, continuous, $12-17 \times 9-12 \mu$.

On living leaves of *Myrica*, Magnolia, Mass., June 1834 (Miss Clarke.) Adirondack Mts., N. Y. (Peck.)

The hyphæ are often elongated to 100 and even 120 μ .

37. RAMULARIA OBOVATA, Fekl. Symb. Mycol. p. 103.

Spots mostly orbicular, arid, 2-8 mm. Hyphæ amphigenous but mostly hypophyllous, fasciculate, simple or subramose, hyaline, continuous or rarely with a single septum below, $70-125 \times 3-4 \mu$. Conidia oblong-obovate, continuous, $18-25 \times 8-11 \mu$.

On leaves of *Rumex*, Massachusetts (Farlow).

38. RAMULARIA PYROLÆ (Trelease). Prelim. List. parasit. Fungi. Wis. p. 14.

Spots circular, dark. Conidia colorless, round-oval to oblong, frequently acute at one end, $3\frac{1}{2}-6 \times 6-17 \mu$, usually 4×12 , not septate.

On leaves of *Pyrola rotundifolia*, Wisconsin (Trelease).

39. RAMULARIA ISARIOIDES (Sacc.) Mich. II, p. 58. *Oidium irregulare*, Pk. 33d Rep, p. 29.

Spots amphigenous, brown, with a narrow, darker border. Hyphæ hypophyllous, densely fasciculate, generally appearing along the nerves of the leaf, filiform, very long ($100-150 \times 2 \mu$), continuous, hyaline above, yellowish below. Conidia broad, fusoid or ovate, $10-18 \times 4-6 \mu$, subapiculate at each end, continuous, hyaline.

On leaves of *Staphylea trifolia*, Penn. (Martin) Wisconsin (Trelease).

b. *Conidia uniseptate*.

40. RAMULARIA DIDYMA, Unger. Exanth. p. 169. *Didymaria Unger*, Cda.

Spots orbicular (2-4 mm.), black at first then dirty white with a black center, a large part of the leaf becoming finally dark brown or nearly black, but still showing the lighter colored spots. Hyphæ mostly hypophyllous fasciculate, $30-50 \times 4 \mu$, toothed above and subgenuate.

Conidia ovate-oblong, 20—35 x 6—8 μ , uniseptate. These notes are from specimens on *Ranunculus Pennsylvanicus*, collected at Charles City, Iowa, by Prof. J. C. Arthur.

Specimens on *Anemone Virginiana*, sent by Mr. E. W. Holway from Decorah, Iowa, differ only in the absence of the light colored spots, the affected parts of the leaf being of a nearly uniform dark brown.

41. RAMULARIA CRYPTA, Cke.

We find no published description of this species, and on the specimens distributed in Ravenel's *Fungi Americani*, no. 581 we can not find any *Ramularia*.

ALPHABETICAL LIST OF HOST-PLANTS.

(The references are to the serial numbers in the preceding descriptions.)

- Actæa alba (*Ramularia Actææ*, Ell. & Hol.) 27.
- Andromeda racemosa (*R. Andromedæ*, E. & M.) 20.
- Aster (*R. filaris*, Fres.) 32.
- Aster puniceus (*R. filaris*, Fres.) 32.
- Astragalus (*R. Desmodii*, Cke., var. *epiphylla*) 31.
- Astragalus Canadensis (*R. Astragali*, Ell. & Hol.) 25.
- Azalea nudiflora (*R. angustata*, Pk.) 17.
- Celastrus scandens (*R. Celastri*, E. & M.) 4.
- Celtis occidentalis (*R. Celtidis*, E. & K.) 6.
- Desmodium (*R. Desmodii*, Cke.) 31.
- Diervilla trifida (*R. Diervillæ*, Pk.) 3.
- Euonymus atropurpureus (*R. Euonymi*, E. & K.) 11.
- 1. Fragaria (*R. Tulasnei*, Sacc.) 7.
- Grindelia squarrosa (*R. Grindeliæ*, E. & K.) 35.
- Hamamelis Virginica (*R. Hamamelidis*, Pk.) 12.
- Heracleum lanatum (*R. Heraclei*, Sacc.) 33.
- Ilex verticillata (*R. Prini*, Pk.) 2.
- Impatiens fulva (*R. Impatientis*, Pk.) 14.
- Mimulus ringens (*R. Mimuli*, E. & K.) 18.
- Mitella diphylla (*R. Mitellæ*, Pk.) 22.
- Myrica (*R. monilioides*, E. & M.) 36.
- Nasturtium Armoracia (*R. Armoraciæ*, Fekl.) 9.
- Nemopanthes Canadensis (*R. Nemopanthis*, C. & P.) 23.
- Orontium aquaticum (*R. Orontii*, E. & M.) 19.
- Oxalis acetosella (*R. Oxalidis*, Farlow) 26.
- Plantago major (*R. Plantaginis*, E. & M.) 5.
- Polygonum amphibium, var. terrestre (*R. rufo-maculans*, Pk.) 15.
- Potamogeton lonchites (*R. aquatilis*, Pk.) 1.
- Potentilla Norvegica (*R. arvensis*, Sacc.) 8.
- Prinos verticillata (*R. Prini*, Pk.) 2.
- Pyrola rotundifolia (*R. Pyrolæ*, Trelease) 38.
- Ranunculus Pennsylvanicus (*R. didyma*, Unger) 40.
- Ranunculus recurvatus (*R. Ranunculi*, Pk.) 29.
- Rudbeckia laciniata (*R. Rudbeckiæ*, Pk.) 13.
- Rumex (*R. obovata*, Fekl.) 37.
- Rumex crispus (*R. decipiens*, E. & E.) 28.
- Sambucus Canadensis (*R. sambucina*, Pk.) 16.
- Solidago (*R. Virgaureæ*, Thuem.) 34.
- Spiræa opulifolia (*R. Ulmaria*, Cke. (?), *R. spirææ*, Pk.) 30.
- Staphylea trifolia (*R. isarioides*, Sacc.) 39.
- Tussilago Farfara (*R. brunnea*, Pk.) 24.
- Urtica gracilis (*R. Urticæ*, Ces.) 10.
- Vaccinium corymbosum (*R. Andromedæ*, E. & M., *R. Vaccinii*, Pk.) 20.
- Vaccinium Pennsylvanicum (*R. Andromedæ*, E. & M., *R. Vaccinii*, Pk.) 20.
- Verbascum Thapsus (*R. variabilis*, Fekl.) 21.

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MICROSPHAERA FULVOFULCRA, CKE.

Prof. Wm. R. Dudley, of Cornell University, in a recent communication called my attention to the fact, first detected by Miss Martha Merry, a student in his laboratory, that the specimens distributed in the North American Fungi, no. 1323, under the above name are a *Podosphaera*, probably *P. minor*, Howe, in Bull. Torr. Bot. Club. vol. V, p. 3. On referring to specimens in my herbarium, sent me from California by Dr. Harkness as *Microsphaera fulvofulcra*, Cke., and which are presumably the same as the specimens examined by Dr. Cooke and published by him in Grev. vol. V, p. 110, as *M. fulvofulcra*, Cke., I find they are the same as the specimens distributed in N. A. F. under no. 1323, being in fact not *Microsphaera* but *Podosphaera*, there being but a single ascus in each sporangium. If, then, the specimens sent me by Dr. Harkness (on *Spiræa*) are really the same as those described by Dr. Cooke in Grevillea, then *Microsphaera fulvofulcra*, Cooke, will have to be cancelled. In any case the N. A. F. specimens and those distributed by Dr. Winter in his Exsiccati, no. 3045, are not a *Microsphaera* but a *Podosphaera* and probably *P. minor*, Howe.

J. B. E.

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No. 7.

CANADIAN FUNGI.

BY J. B. ELLIS & BENJAMIN M. EVERHART.

The Fungi here enumerated were received from Prof. John Macoun, Botanist to the Geological and Natural History Survey of Canada, and were mostly collected during the summer of 1884. The collection, though small and consisting mostly of species already known, comprises some not heretofore recorded in this country.

UREDINEÆ.

PUCCINIA MESOMEGALA, B. & C.—On *Clintonia borealis*, Lake Ellen, Nipigon River, June.

PUCCINIA CONGREGATA, E. & H.—On *Mitella nuda*, islands in Lake Nipigon.

PUCCINIA ASTERIS, Duby, var. **PURPURASCENS**, C. & P.—On *Aster macrophyllus*, Lake Superior region.

PUCCINIA NARDOSMII, E. & E.—Sori numerous, hypophyllous, purplish brown, subconcentrically arranged in circular clusters about 4 mm. in diameter, soon naked. Spores rather variable in shape, elliptical to oblong and often more prominent on one side, scarcely constricted at the septum, 25—30 x 15—20 μ , often narrowed above, episore smooth, thickened at the apex with a distinct, subhyaline papilla, pedicels about as long as the spores, fragile and easily deciduous.

On leaves of *Nardosmius* (*Petasites*) *palmatius*, Red Rock, Lake Superior, June.

The mostly smaller spores with smooth episore and the more decided, clustered mode of growth would seem to sufficiently distinguish this from *P. Compositarum*, Schlect.

UROMYCES OROBI, Winter.—On *Lathyrus ochroleucus*, Long Portage, Nipigon river.

TRIPHragmium CLAVELLOSUM, Berk.—On *Aralia nudicaulis*, Burnt Island, Nipigon river, July.

RÆSTELIA LACERATA, Tul.—On *Cratogeomys tomentosa*. Near Ottawa, August. Possibly these specimens are referable to *R. cornuta*, Tul. Some of them are certainly distinguishable with difficulty from that species.

ÆCIDIUM COMPOSITARUM, Mart.—On leaves of *Aster Lindleyanus*, Nipigon river, July. Another form (of this species?) on *Lactuca Canadensis* from the same locality has the æcidia densely clustered in patches $\frac{1}{2}$ cm. in diameter.

ÆCIDIUM GROSSULARIÆ, DC.—Lake Ellen, Nipigon river, June.

ÆCIDIUM RANUNCULACEARUM, DC.—On *Anemone nemorosa*, Nipigon river, July. This is the form distributed in N. A. F. 1003 a.

ÆCIDIUM ALBUM, Clinton.—On *Vicia Americana*, Nipigon river, July.

ÆCLÆIUM CALADII, Schw.—On *Ariscæma triphyllum*, Ottawa, June.

ÆCIDIUM VIOLÆ, Schum.—On *V. renifolia*, Ottawa, June.

COLEOSPORIUM MINIATUM (Pers.)—On *Rosa blanda*, Red Rock, Lake Superior, June.

MELAMPSORA SALICINA, Lev. (Uredo.)—On willow leaves, Lake Nipigon, July.

UREDIOBTUSA, Strauss.—On *Potentilla gracilis*, Moose Jaw, N. W. Terr., May.

UREDIOBTUSA, Reb.—On leaves of *Rubus*.

UREDIOBTUSA, DC.—Lake Nipigon, July.

CEOMA LUMINATUM, Schw.—On *Rubus triflorus*, Ottawa, June.

USTILAGO URCEOLORUM, Tul.—Fruit of *Carex siccata* and *C. canescens*, Lake Nipigon, June.

IMPERFECT FUNGI.

EXCIPULA CONGLUTINATA, E. & E. (in Bull. Wash. Coll. no. 1, p. 6.) Dead stems of *Ranunculus*. Cape Chudleigh. The specimens are in no way distinguishable from the original Mt. Paddo specimens.

EPHELIS BOREALIS, E. & E.—Stroma of a grayish buff color and of fine grumous texture, extending along and enveloping the leaf for about $\frac{1}{2}$ cm., after the manner of *Epichloe typhina*, Fr. Spores masses not numerous (2–5 on a stroma), innate, causing convex swellings which are at first covered by the superficial layer of the stroma but are at length exposed with an imperfect margin, appearing somewhat like a flat *Peziza*. Spores acicular, nearly straight or often bent in the middle, hyaline or pale yellowish, nucleolate (?), ends subobtusely, $15-25 \times \frac{1}{2} \mu$.

On leaves of living grasses, Nova Scotia, June, 1883. Possibly this may not prove sufficiently distinct from *E. Mexicana*, Fr., but that species is said to have a black stroma and infests the inflorescence of grasses.

LYCOPERDINEÆ.

LYCOPERDON ATROPURPUREUM, Vitt.—Ottawa.

SECOTIUM WARNERI, Pk.—Among rubbish in gardens, Ottawa.

MYCENASTRUM OREGONENSE, E. & E., Ottawa.

The following species of *Lycoperdon* apparently undescribed was

sent with a collection of lichens and mosses from Labrador, by Mr L. M. Turner, to Mr. Everhart for determination.

LYCOPERDON TURNERI, E. & E.—Peridium obovate, 4–6 cm. in diameter, olive brown, rather firm, clothed with a coat of rather short subspinose-warts which finally fall off and leave the surface smooth. Sterile base distinct, about 1 cm. thick, passing gradually into the rather dense mass, dirty gray (when cleared of spores) capillitium without any definite columella. Spores globose, yellowish-olive, echinate-verrucose, 4–5 μ with a slight rudimentary pedicel. The peridium is contracted and subplicate below but not stipitate, and is finally irregularly ruptured above.

BOVISTA TABACINA, Sacc. Mich. II, p. 565.—Globose, rather large (4–5 cm.), nearly rootless. Peridium membranaceo-coriaceous, lead-colored, finally variously ruptured. Nucleus compact-lanose, elastic, tobacco-colored, composed or rather rigid, many times dichotomously branched, dark brown (atrofuligineis) threads, paler above, the larger branches 10–12 μ thick. Spores globose, minute, smooth, with a single nucleus, 3½–4 μ , yellow-olive with a minute rudimentary pedicel. On the ground, Canada. Le Metayer.

We have not seen this species, and copy the description from Michelia.

SPHÆRIACEÆ.

PODOSPHÆRA KUNZEI, Cda.—On leaves of young seedling elms, Ottawa.

PLEOSPORA HERBARUM (Pers.)—Dead stems of *Papaver nudicaulis*, Cape Chudleigh. Sporidia 30–35 x 16–18 μ .

PLEOSPORA HISPIDA, Niessl.—Dead stems of *Draba*, Digger's Island (Hudson strait.) Perithecia 200–300 μ in diameter, fringed at base, with brown creeping threads and a few spreading hairs, ostium also surrounded with a fringe of brown, sparingly septate, spreading hairs 60–75 μ long. Asci 80–100 x 20–25 μ , contracted at base into a short pedicel. Sporidia oblong-elliptic, 5–7-septate and muriform, straw yellow at first, becoming dark brown, 20–26 x 10–13 μ , mostly constricted about the middle. Agrees well with Niessl's description and with the specimens in Rab-Winter's Fungi 2857, except that the hairs are not as evenly distributed over the perithecia which, excepting the basal and apical fringe are nearly bald. On the same stems are smaller perithecia filled with stylospores oblong-cylindrical, 3-septate, 20 x 4 μ .

SPHÆRELLA STELLARINEARUM, Karst.—On dead stems and leaves of *Stellaria longipes*, Cape Prince of Wales. Also on *Draba alpina*, Nottingham's Island, Hudson Strait. Sporidia 20–27 x 5–7 μ .

RHYTISMA SALICINUM, Pers.—Leaves of *Salix herbacea*.

LOPHODERMUM ARUNDINACEUM (Schrad.)—On *Elymus mollis*, Digger's Island, Hudson's Strait.

NUMMULARIA PEZIZOIDES, E. & E., Bull. Torr. Bot. Club, XI, p. 74. Will have to be abandoned, being in fact not specifically distinct from *N repanda* (Fr.)

NEW SPECIES OF FUNGI.

BY J. B. ELLIS AND BENJAMIN M. EVERHART.

The following species which, so far as we know, have not hitherto been described, have been received from various localities.

CORTICIUM EPIGÆUM, E. & E.—Thin, white, uneven, subvelutinous, margin slightly byssoid. Internal structure similar to that of the preceding but less compact and lateral branches of the fertile hymenial threads, shorter and less distinctly subulate. Spores subglobose, smooth, about $5\ \mu$ in diameter, consisting of a transparent, globose nucleus ($3\ \mu$) enclosed in a membranaceous sack.

On the bare soil, July, 1884. Carpenter, no. 100.

CORTICIUM THELEPHOROIDES, E. & E.—Dirty, yellowish white, subferruginous within, surface tuberculose and subvelutinous. Substance about $\frac{1}{2}$ mm., thick, composed of closely compacted erect threads with many short, lateral branches, erect and subdichotomous above, the ultimate divisions subulate-pointed, and bearing the coarsely tubercular-roughened, globose, brownish, $5-7\ \mu$ spores. Margin concolorous, thin, and the whole closely adnate to the matrix. Outwardly bearing some resemblance to *C. ochroleucum*, Fr. var. *spumeum*, B. & Rav., but really quite distinct. On fir logs, July, 1884. Carpenter, no. 90.

LYCOPERDON LEPIDOPHORUM, E. & E.—Obovate or subglobose, large, 15 cm. high by 20 cm. broad. Peridium consisting of a thick outer bark or layer which breaks up and falls away in irregular shaped, sub-polygonal fragments 3—4 cm. across and 1 mm. thick, with a thickened, white, areolate-marked, raised center of irregularly polygonal outline much like the scales on a turtle's back. When these scales fall off they reveal the thin, soft, paper-like, olive-brown inner peridium which again separates quite readily from the yellowish-olive mass of spores and capillitium. The dehiscence appears to be by the irregular rupturing and disappearance of the upper portion of the peridium. The capillitium is quite dense, filling the entire cavity of the peridium without any distinct sterile base, and consists of rather slender ($3-5\ \mu$) threads, nearly smooth and more or less dichotomously branched. Spores yellowish-olive, globose, strongly echinulate-warted, $4-5\ \mu$ in diameter, with only the rudiment of a pedicel.

Sent from Huron, Dakota, Sept. 1884, by Miss Nellie E. Crouch.

SLCERODERMA FLAVIDUM, E. & E.—At first entirely buried in the sand, but soon partially emerging and splitting at the apex in a stellate manner into 6—8 subtriangular lobes or teeth and exposing the snuff-brown mass of spores which are soon scattered by the wind and rain, leaving the cup-shaped peridium with its stellate-lobed, reflexed margin entirely empty. Spores globose, rough (coarsely echinulate) snuff-brown, $7-12\ \mu$ diameter, with a few branching filaments intermixed. Peridium depressed-globose, coriaceous, firm (3—4 cm.), light yellow, roughened

with innate, granular, minute rudimentary warts above, smoother and subplicate below, with strongly developed, yellowish roots forming a mass as large as the peridium itself, and which remain permanently fixed in the ground after the peridium itself has broken away.

In loose sand, Willow Grove, N. J., Oct. 1883. Abundant. Differs from *S. Geaster*, Fr., in its smaller size, yellow color, thinner peridium, larger spores and more strongly developed roots. From *S. vulgare*, Fr., it differs in its stellate dehiscence and subterranean mode of growth.

MYCENASTRUM OREGONENSE, E. & E.—Semi-subterranean, globose, coriaceous, milk-white and nearly smooth at first, becoming somewhat mealy with a few very faint rudimentary spines or imperfect tubercles at the apex, 4–6 cm. in diameter, subplicate below with a single short, cord-like root. Peridium brown and smooth when mature, rupturing irregularly above. Capillitium snuff-brown or grayish, collected in small, loose, globular masses which consist of stout, much branched threads, the branches running out with free ends which are more or less undulate or crisped, or occasionally subtuberculose or showing here and there rudimentary spines. The larger or main branches of the capillitium are 10–14 μ thick. Spores globose, snuff color, $3\frac{1}{2}$ –4 $\frac{1}{2}$ μ , smooth with only the rudiment of a pedicel.

In grassy ground, Coos Co., Oregon. “Appearing a few days after a rain.” May and June, 1884, W. S. Carpenter, no. 64. Sent also from Ottawa, Canada, by Prof. Macoun, and from northern Michigan by Prof. F. E. Wood.

In *Grevillea*, vol. 13, p. 6, Dr. Cooke proposes for this and the following species together with *M. lycoperdoides*, Cke., and *M. leiospermum*, Mont., the subgenus *Sterbeckia* to include the species with smooth spores and capillitium without spines.

MYCENASTRUM OHIENSE, Ell. & Morgan.—Peridium subglobose (3–3 $\frac{1}{2}$ cm.) coriaceous, olive-brown when mature, rupturing irregularly above, surface densely granulose, more coarsely so above, plicate below with a single, short, stout root and filled with the mass of clay-colored or grayish spores and capillitium which is attached to the inner surface of the peridium on all sides and runs gradually into the sterile cellular base which occupies $\frac{1}{4}$ – $\frac{1}{3}$ of the cavity. Spores nearly hyaline (under the microscope), ovate-globose, smooth, 3–3 $\frac{1}{2}$ μ in their longer diameter, on slender pedicels which are rather longer than the spores. The capillitium as in the preceding species is collected more or less distinctly into little loose balls (something as in *Arachnion album*, Schw.), main threads 6–7 μ thick, branches attenuated and showing here and there rudimentary spines and tubercles. Quite distinct from the preceding species in which, besides the other differences, the sterile base is almost obsolete.

Sent first from Mt. Carmel, Ill., by Dr. J. Schenck, Oct. 1881, and since found more abundantly in Ohio by Prof. A. P. Morgan who has also received from Florida what appears to be the sterile base of this

species which shows that the peridium becomes at length entirely smooth and then of a lighter color.

SCHIZOXYLON OCCIDENTALE, E. & E.—Perithecia gregarious or nearly so, depressed globose, white with a round, black disk or epithecium which is scarcely perforated. Hymenium cup-shaped, yellowish horn-color, of a waxy consistence. Asci very long, 200–300 μ and over by 6–8 μ wide, 8-spored, surrounded with numerous filiform, nucleolate paraphyses which are rather more slender than the long, filiform, sporidia which are nearly as long as the asci, $2\frac{1}{2}$ – $3\frac{1}{2}$ μ thick, somewhat attenuated above, multiseptate, hyaline, constricted at every alternate septum where they readily separate into short (6–15 μ) cylindrical segments with the ends rounded with a single septum across the middle. Possibly this may not be distinct from *S. alboatrum*, Rehm. Ascom. 478. The outward appearance is much the same, but that species is said to have sporidia multicellular, fragile, almost as if articulated (“fere ut articulata”) and 180 x 2 μ . If the same, Dr. Rehm’s specimens must be immature. From *S. Berkeleyanum*, Dur. & Lev. the Utah specimens differ in having the sporidia twice as thick.

CHAETOMIUM VELUTINUM, E. & E.—Perithecia ovate, membranaceous, gregarious and more or less confluent, covered with a dense, even, velvety coat of rough, olive-black hairs, of which the apical ones are nearly straight and coarser, while those toward the base are finer and somewhat branched. Sporidia almond-shaped, brown, 11–12 x 6–7 μ . The asci were already dissolved so that their shape could not be seen. The general aspect is that of *Sphaeria hirsuta*, Fr., but the hairy coat is more dense and even. On a damp maple log, Aug. 1884, Carpenter, no. 98.

BULGARIA STRIATA, E. & E.—Imperfectly obconic, about 1 mm. high and 2–3 mm. broad, purplish liver-color with a flesh-colored tint, margin obtuse, slightly incurved and striate when dry. Asci 150 x 7 μ with a long, slender base. Paraphyses abundant, filiform, scarcely thickened above. Sporidia biserial in the upper part of the asci, fusiform-oblong, slightly curved, 12–14 x 3– $3\frac{1}{2}$ μ , with the endochrome imperfectly divided in the middle (probably becoming 1-septate). The whole when fresh is of a coriaceous-gelatinous texture, the receptacle showing much the same structure as in *Tremella*. The striate margin and more regular shape will distinguish this from *B. sarcoides*, Fr. On rotten wood, November, 1884.

PEZIZA (OTIDEA) DORATOPHORA, E. & E.—Subcæspitose, subglobose, with a small, circular opening at first, at length expanding but mostly one-sided, rufous or chestnut brown and echinate-granulose outside and narrowed below into a short subpubescent base, disk darker when fresh. Asci subcylindrical, sessile, 50–60 x 6–7 μ . The paraphyses consist of a thread-like base bearing a brown, lanceolate-cylindrical abruptly pointed head which is 20–30 μ long by 3–4 μ thick and at length 1–2-septate and easily separates from the slender base. Sporidia biserial, elliptical, 2-nucleate, subfuscous, 6–10 x 3–4 μ . The fibrose-cellular

substance of the cups is of a vinous purple color under the microscope. On old logs and stumps, White Mts., N. H., Sept. 1884, Miss S. Minns.

DIATRYPE MINIMA, E. & E.—Stroma cortical, formed of the scarcely altered substance of the bark, elliptical, 1–2 mm. in diameter, limited by a black circumscribing line which penetrates the wood beneath. Perithecia 8–12 in a stroma, lying in a single layer, globose (1.6–1.5 mm.) membranaceous with black, rather thick walls and short, obtuse ostiola, their apices papilliform, black and shining at first, then distinctly perforated with a rather broad opening. Asci cylindrical, 70–80 x $2\frac{1}{2}$ –3 μ . Paraphyses obscure (or none?). Sporidia uniseriate, lying end to end, oblong-elliptical, 2-nucleate, yellowish, nearly hyaline, 5–7 x 2 μ . The black, scarcely projecting ostiola which dot the small tuberculiform stroma are visible through short, longitudinal cracks or chinks in the slightly elevated epidermis. On dead shoots and limbs of *Magnolia glauca*, Newfield, N. J., April, 1885. First noticed in December, 1881. Probably not uncommon but easily overlooked.

LEPTOSPHERIA HARKNESSIANA, E. & E.—Perithecia scattered or gregarious, at first covered by the epidermis, at length bare and superficial or nearly so, hemispherical, black, smooth, $\frac{3}{4}$ – $\frac{1}{2}$ mm. in diameter. Ostiolum short, cylindrical, with a large, circular opening. Asci cylindrical, 100–114 x 10–12 μ , 8-spored and surrounded with filiform paraphyses. Sporidia in a single series, lying end to end, elliptical, yellow-brown, 3-septate and constricted at the septa, 18–22 x 7–9 μ , obtusely pointed above and regularly rounded below. The perithecia are much like those of *Sphaeria subconica*, C. & P., but the ostiolum is shorter. On dead stems of “Columbo” (*Frasera*?) Emery Co., Utah, S. J. Harkness, no. 106.

SPHERIA (METASPHERIA) CAVERNOSA, E. & E.—Perithecia coriaceous-carbonaceous, black, rather thin walled, $\frac{1}{2}$ – $\frac{3}{4}$ mm. in diam., sometimes 2–3 united, at first covered by the fibres of the bark, the upper half at length projecting and nearly bare. Ostiolum subtuberculiform, obtuse, broad. Asci clavate-cylindrical, 80–115 x 12–15 μ , with filiform paraphyses. Sporidia uniseriate or partly bi-seriate above, rather acutely elliptical, endochrome 3-times divided, hyaline, 18–22 x 7–9 μ . The upper part of the perithecium at length falls away, leaving the black, cup-shaped, hemispherical base bedded in the bark. Closely allied to *S. leiostega*, Ell., which is scarcely distinct from *S. corticola*, Fekl. It differs however in its denuded perithecia, longer and broader asci, and rather longer sporidia. The sporidia of *S. leiostega* are mostly 14–18 x 7–8 μ , very few reaching 20 μ long, as stated in Torr. Bull. On bark of *Taxodium distichum*, Darien, Ga., H. W. Ravenel, 703.

SPHERIA (WINTERIA) CÆRULEA, E. & E.—Perithecia scattered, membranaceous, flattened, $\frac{1}{3}$ – $\frac{1}{2}$ mm. in diam., covered by the thin epidermis which is either soon partially ruptured or remains closely attached to the surface of the perithecia which are plainly visible through it. Ostiolum broad, papilliform, obtuse, collapsing when dry so that the perithecia

appear umbilicate. Asci 75—114 x 15—17 μ , oblong-cylindrical, abruptly contracted below into a short, stout base, and surrounded by filiform paraphyses. Sporidia 3 in an ascus, broad fusiform or clavate fusiform, narrowed below into an acute, awl-shaped base, yellowish, multiseptate (8—12) and submuriform, 30—35 x 7—8 μ . On bark of some living coniferous tree, Wash. Terr., leg. W. N. Saksdorf, 210 in part, com. C. J. Sprague.

SPHÆRIA (WINTERIA) RHUINA, E. & E.—Perithecia erumpent, densely gregarious, subseriate, subglobose, black ($\frac{1}{8}$ — $\frac{1}{2}$ mm.) membranaceous, thin and collapsing so as to become concave or patelliform. Ostiolum papilliform and mostly 4—5-stellate-cleft. Asci 45—60 x 7—8 μ , broadest in the middle. Paraphyses stout, linear, nucleolate. Sporidia biseriate, fusiform, yellowish, nucleolate, straight or slightly curved, sometimes strongly so, 20—25 x 2 $\frac{1}{2}$ —3 μ . On weather-beaten wood of *Rhus copallina*, Newfield, N. J., May, 1885.

ASTERINA PEARSONI, E. & E.—Perithecia minute (100 μ) flat, superficial, obscurely perforated above, of close, cellular structure, with a scanty, subradiating mycelium around the margin. Asci sessile, oblong, obtuse, 40 x 15 μ , without paraphyses. Sporidia biseriate, clavate-oblong, granular, becoming uniseptate and slightly constricted at the septum, 15—20 x 3 $\frac{1}{2}$ —4 $\frac{1}{2}$ μ , acute below, obtuse above, hyaline. Has much the same appearance as *A. Gaultheriæ*, Curtis. On living canes of cultivated blackberry, Vineland, N. J., May, 1885, Col. A. W. Pearson.

HARKNESSIA CUDATA, E. & E.—Acervuli innate-erumpent, globose, at first entirely covered by the epidermis which is finally pierced with a circular opening revealing the mass of dark brown spores which at length ooze out in the form of a small black globule. Spores fusiform-elliptical, brown, 15—20 x 6—8 μ , on cylindrical, hyaline, 12—15 x 2 $\frac{1}{2}$ —3 μ basidia and with a bristle-like, hyaline, nearly straight or slightly curved apical appendage 15—25 μ long and not quite as stout as the basidia which remain permanently attached to the base of the spore. Apparently the stylosporous stage of *Valsa farinosa*, Ell. See Bull. Torr. Bot. Club, IX, p. 99. On dead oak leaves and twigs, Newfield, N. J.

HARKNESSIA HYALINA, E. & E.—Acervuli innate, subglobose ($\frac{1}{4}$ mm.) covered by the epidermis which is elevated and ruptured above (sometimes in a stellate manner), revealing the mass of spores which ooze out in a small, whitish globule. Spores oblong-fusiform, hyaline, or with a yellowish shade, 20—25 x 4—6 μ with a bristle-like, apical appendage, straight or slightly curved, 15—20 μ long; basidia short, cylindrical or subconical, 6—10 x 4 μ . The general appearance is much like that of *H. caudata*, E. & E., but the pustules are not as prominent. Varies from the type in its hyaline spores, but all the other characters are those of *Harknessia* as originally published by Cooke in Grevillea IX, p. 85.

PHYSALOSPORA QUERCIFOLIA, E. & E.—Perithecia $\frac{1}{4}$ — $\frac{1}{2}$ mm. in diameter, globose with a light colored nucleus, buried in the substance

of the leaf but prominent so as to show distinctly on both sides, covered by the epidermis which is slightly blackened and closely adherent to the perithecia, ostiolum papilliform, barely visible through the ruptured epidermis. The perithecia finally collapse more or less distinctly. Asci oblong, $75-80 \times 12 \mu$ with a short, abruptly contracted base. Sporidia biseriate, narrow-elliptical or broad-fusiform, granular, hyaline, $15-25 \times 6-8 \mu$. With *Harknessia hyalina*, E. & E., which is probably its stylosporous stage, on dry, dead oak leaves (*Q. coccinea*) still hanging on limbs cut off last season. Newfield, N. J., June, 1885.

ÆCIDIUM RÆSTELIODES, E. & E.—Hypophyllous, on slightly thickened, yellowish spots which finally become purplish. *Æcidia* clustered, subcircinate, $15-40$ in a group, hemispheric and closed at first, then campanulate or short-cylindrical with the margin about 6-cleft and a little spreading and finally lacerated to the base into narrow segments about 1 mm. long after the manner of *Ræstelia lacerata*, Tul. Spores pale, subglobose, about 22μ in diameter, with a thick, finely sculptured epispore giving the appearance of a broad, band-like margin around the spore. On leaves of *Sidalcea*, Spokane Co., Wash. Terr., W. N. Suksdorf, no. 144.

STEGANOSPORIUM CENANGIODES, Ell. & Rothrock.—Stroma erumpent, tuberculiform, then excavated and discoid above, the margin at length expanding so as to resemble a brown, thin substipitate *Peziza*. Spores broad, oblong-fusiform or ovate-oblong, endochrome 5–8 times divided and muriform, $35-40 \times 10-15 \mu$, pedicellate. The expanded *Cenangium*-like stroma appears finally, in some cases at least, to produce the “*Fusisporium Berenice*” (N. A. F. 376.) The whole thing is a curious and rather anomalous production, the true nature of which is not yet well understood. On dead limbs of *Abies balsamea*, West Chester, Pa., Dr. J. T. Rothrock. See N. A. F. no. 1379.

SEPTONEMA SUBRANOSUM, E. & E.—Effused, black, consisting of subfasciculate, erect, simple or branched closely, septate threads, $70-100 \mu$ long or more and $6-7 \mu$ thick. These threads are sometimes constricted at intervals as if composed of separate concatenated spores yet they separate but sparingly. The terminal cells are nearly hyaline. This is much like *S. toruloidea*, C. & E., differing principally in the threads not separating into separate spores. Possibly not distinct from *S. atrum*, Sacc., but we have no specimen of that species. On weather-beaten wood, Coos Co., Oregon, Feb. 1885, W. S. Carpenter, no. 28.

RHINOTRICHUM CARNEUM, E. & E.—Forms a loose, floccose stratum, dull white at first, then flesh-colored. Hyphæ coarse, fertile tips obtusely rounded, bearing the globose, delicately warted, 5μ spores on minute spicules. On bark, Coos Co., Oregon, W. S. Carpenter, no. 125.

DISTRIBUTION OF PUCCINIA HETEROSPORA.

BY A. B. SEYMOUR.

When the note on *Puccinia heterospora* in the Botanical Gazette, December, 1883, was prepared, the hosts known were *Sida triquetra*, *S. humilis*, *S. hirsuta*, *S. spinosa*, *S. rhombifolia*, *Abutilon Texense*, *A. parvulum* and *Anoda hastata*; and the localities, Illinois, Texas, Cuba, Ceylon, and South Africa.

A search through the Malvaceæ of the Gray Herbarium has revealed the following :

SIDA SUPINA, Key West, Florida, Feb. 1846, Regel (100).

S. PHYSOCALYX, Texas, 1847-8, Lindheimer (583).

S. HUMILIS, Moridabad, India, Dr. Thompson (325).

ABUTILON CRISPUM, Key Largo, S. Florida, May. A. H. Curtiss, Fl. Texano-Mexicana, Bolandier (2237). Maydallum, Sept. 18, Thurber (1030). San Luis Potosi, 1876, Schaffner (163).

A. TEXENSE, Santa Catalina Mts., Arizona, Apr. 1881, Lemmon. Sonora, Mex., 185, Thurber.

A. BOLANDIERI, San Fernando, Oct. 1835. Bolandier, Fl. Tex.-Mex. 3050.

A. SEDOIDES, San Luis Potosi, Mex., 1878, Parry & Palmer.

A. VILLIFERUM, McArthur river, Australia, Mueller.

ANODA HASTATA, Chili, Meyen,

GAYA SUBTRILOBA, San Luis Potosi, Mex., 1878, Parry & Palmer (92). Peru, Mathews (3236).

MALVAVISCUS DRUMMONDII, (only 1-celled spores seen). Texas, 1843, Lindhemier (25).

URENA, Fernando Po., Hooker's Niger Exp. 1843, Vogel (202).

NEW LITERATURE.

BY W. A. KELLERMAN.

CHARLES H. PECK.—“New Species of Fungi,” in the Bulletin of the Torrey Botanical Club, April, 1885.

Eleven new species are here described and a plate of figures illustrates three of them. They are as follows: *Boletus sphærosporus*, Pk. (Wisconsin); *Septoria astragalicola*, Pk., on living or languishing leaves of *Astragalus* (Arizona); *Puccinia tumidipes*, Pk. II and III, on living leaves of *Lycium Andersonii* (Arizona); *Puccinia globosipes*, Pk., on leaves of *Lycium Californicum* (California); *Puccinia Brickelliae*, Pk. II and III, on living leaves of *Brickellia* (Arizona); *Puccinia Pentstemonis*, Pk., on living leaves of *P. linarioides* (Arizona); *Puccinia Malvastris*, Pk., on living leaves of *Malvastrum* (Arizona); *Puccinia Viguiæ*, Pk.,

on leaves of *Viguiera* (New Mexico); *Uromyces Sophoræ*, Pk., on living leaves of *S. sericea* (New Mexico); *Ustilago Aristidæ*, Pk., spikelets of *Aristida* (El Paso, Texas); and *Uredo Jonesii*, Pk., living leaves of *Ribes* (New Mexico).

SACCARDO & BERLESE.—“*Miscellanea Mycologica*,” a small pamphlet in which are published the following species of North American fungi :

IRPEX FORMOSUS, Sacc.

Pilei definitely lateral, frequently two confluent, flabelliform, margin deeply incise-lobed, narrowed behind, pale alutaceous, 6—7 cm. long, membranaceo-coriaceous, flat, longitudinally substriate, scarcely discolored-zonate, with a shining, silky surface but almost glabrous. Teeth crowded, narrow, acute, incised, slightly connected by a narrow membrane at base, alutaceous.

On trunks, Mexico (Galeotti). Allied to *I. zonatus* and *I. incrustans*, but differs in its minute, crowded teeth.

CHROMOSPORIUM VITELLINUM, Sacc. & Ell.

Effused, pulveraceous, bright golden yellow. Conidia ellipsoid, $6\frac{1}{2}$ —7 x $4\frac{1}{2}$ —5 or globose, 5—6 μ , yellow.

On old *Polyporus* and on rotten wood adjacent, New Jersey.

FUSARIUM SCOLECOIDES, Sacc. & Ell.

Tufts arachnoid, subeffused, white, minute. Hyphæ long, simple or forked, 130—180 x 2 μ , subseptate, hyaline. Conidia narrowly fusoid, acute at each end, curved, 5-septate and variously nucleate, 70—80 x 3—4 μ hyaline.

On branches of *Robinia*, Bethlehem, Pa., E. A. Rau.

CONIOTHYRIUM ARTHURIANUM, Sacc & Berlese.

Perithecia gregarious, covered by the epidermis, globose-depressed, subpapillate, 1-6 mm. in diameter, black. Spores globose-ellipsoid, rounded at each end, 5—6 x 4—5 μ , pale olivaceous.

On herbaceous stems (*Cucurbita*?) Geneva, N. Y., with *Epicoccum neglectum*, Prof. J. C. Arthur.

MARTINDALIA, Sacc. & Ell., nov. gen.

[Dedicated to Isaac C. Martindale, the well known phænogamic botanist, of Camden, N. J.]

Stipe (or stroma) subterete, formed of compacted, filiform, hyaline threads. Fertile hyphæ projecting from the apex of the stipe and forming a loose head, threads loosely involute and laterally nodulose, bearing the hyaline, globose conidia along their sides. Differs from *Stilbum* and *Isaria* in the absence of mucus and in the spirally convolute, fertile threads.

MARTINDALIA SPIRONEMA, Sacc. & Ell.

White throughout, stipes 1—2 mm. high, thickened at the base, terminating above in an oval head, not pulverulent or mucose. Fertile hyphæ or basidia long, continuous, 2—3 μ diameter, hyaline, spirally involute above, with minute, lateral teeth. Conidia globose, 5—6 μ , with a single nucleus, hyaline or pale rose color.

On elm barrel staves in a cellar, Newfield, N. J., June, 1884.

[TO BE CONTINUED.]

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No. 8.

NEW FLORIDA FUNGI.

BY J. B. ELLIS AND DR. GEO. MARTIN.

The species here described were mostly collected by Dr. Martin at Green Cove Springs, Florida, in the winter of 1885.

PATELLARIA CYANEA, E. & M.—On living leaves of *Quercus (laurifolia?)* February. Gregarious or scattered, hypophyllous. Excipulum patelliform, sessile, orbicular, 275 μ diameter, convex and obscurely marginate, becoming concave, nearly indigo-blue and surrounded by a scanty mycelium which stains the leaf blue. Asci oblong-cylindrical, contracted at the base, 8-spored, 27—30 x 6 μ , without paraphyses. Sporidia biseriate, obovate, 1-septate, hyaline, 7—9 x 3 μ .

Has the general aspect of *Asterina subcyanea*, E. & M., also much resembles *Patellaria nigro-cyanea*, Phill. & Hark., outwardly, but that species has asci 75 x 15 μ and sporidia 14—16 x 3—4 μ .

ASCOMYCETELLA AURANTIACA, E. & M.—On leaves of *Quercus laurifolia*, March. Dull orange-yellow, hypophyllous, flat, scattered, 380—400 μ diameter. Asci obovate or pyriform, contracted below into a short stipe, 25—38 x 12—15 μ . Sporidia crowded, obovate, 1-septate, constricted at the septum, granular at first, becoming clear and hyaline, 12—15 x 4—6 μ . Paraphyses none. Conidia abundant, forming small, loose, white tufts scattered over the lower surface of the leaf and consisting of closely packed bundles of hyphæ 100—150 x 12—15 μ , bearing lateral and terminal, hyaline, oblong-elliptical, 5—7 x 2—3 μ conidia. The bundles of hyphæ are hyaline and cylindrical, and separate at intervals of 12—20 μ into sections squarely truncate at each end. Apparently the growth is proliferous; the little bundles of hyphæ, after reaching the height indicated and bearing at their apices a crop of conidia, continue their united growth for 12—20 μ further, where they bear another crop of conidia; and this process is repeated several times, a joint or articula-

tion being formed at each resting point which is also marked by a ring of conidia surrounding the bundle of hyphæ at these points. This differs from *A. sulfurea*, Winter, of which we have a specimen, in its smaller septate sporidia and the presence of conidia. The sporidia of *A. aurantiaca* seem to be mature, and we do not think they ever become 3-septate as in *A. sulfurea*.

In Grevillea, vol. 4, p. 156, we find the following brief diagnosis of *Capnodium pelliculosum*, B. & Rav.: "Threads of the mycelium erect, trifid at the apex, after the fashion of a *Tripodsporium*, shorter than the oblong, constricted perithecia." Specimens of this production have been distributed in De Thumen's Mycotheca, 2059, and in Rav. F. Am., no. 79, on living leaves of *Prunus Chicasa*, from South Carolina, but in our copies of both these exsiccati the specimens are without perithecia and show no trace of "threads trifid at the apex." Specimens, however, collected by Dr. Martin, at Green Cove Springs, Florida, on leaves of *Magnolia glauca*, in February and March, 1883, show both the pycnidial and ascigerous perithecia and the *Tripodsporium*-like tips of the threads of the mycelium. As this latter character is a striking one, and as our specimens on *Magnolia* agree well enough in other respects with the diagnosis above quoted and with the specimens in the exsiccati referred to, we consider it tolerably certain that they represent the mature state of the species in question, and have written out a detailed description as follows:

CAPNODIUM PELLICULOSUM, B. & Rav.—On leaves of *Magnolia glauca*, February. Mycelium epiphyllous, forming a thin, sooty-colored layer on the surface of the leaf and consisting of closely septate, brown, subrectangularly branched and interwoven threads, $5-8\ \mu$ thick, with each cell or joint nucleate and bearing when well developed, stellately 3-4-parted conidia, much like those of *Tripodsporium*, nearly hyaline at first, becoming brown, each arm 4-5 septate and nucleate, $7-9\ \mu$ thick at the base and $50-75\ \mu$ long, tapering to an obtuse point at the apex. Pycnidial perithecia growing like thick branches from the sides of the prostrate threads, membranaceous, of rather coarse cellular structure, oblong or flask-shaped, $75-200 \times 30-50\ \mu$, apex subobtuse and subfimbriate, discharging countless, minute, hyaline, oblong spores, $3-4 \times 1\ \mu$. Sometimes these perithecia are quite globose and formed by the enlargement of one of the component cells of a thread or hypha. There are also produced from the mycelium cylindrical, brown, multiseptate conidia, $70-80 \times 6-7\ \mu$, like the conidia of *Helminthosporium*. Ascigerous perithecia seated on the mycelium, depressed-globose, membranaceous, $100-150\ \mu$ diameter, with brown, septate appendages like those of an *Erysiphe* 15-25 in number, $75-100\ \mu$ long. Asci at first oblong, becoming ellipsoidal and about $40-25\ \mu$. Sporidia crowded, broad-fusiform, hyaline, 1-septate at first, becoming 3-septate at maturity, and $15-22 \times 4-7\ \mu$.

ASTERINA STOMATOPHORA, E. & M.—On living leaves of *Quercus laurifolia*, February and March. Perithecia lenticular, scattered, small,

170—185 μ diameter, with a thin, reticulated margin and indistinctly perforated in the center, texture cellular. Asci 30—35 x 6—8 μ , oblong and rather broader below and abruptly contracted into a short, stipitate base. Paraphyses none. Sporidia biseriate, oblong, 1-septate, rather narrower and more acute at the lower end, 7—12 x $2\frac{1}{2}$ —3 μ , hyaline. When a perithecium is removed from the leaf, a piece of the epidermis often adheres to its lower surface so that under the microscope the stomata are visible through the thin edge of the perithecium, appearing as if they actually formed a part of it. It is to be noted that in this and most of the other species with flattened perithecia, the wall of the perithecium is nearly obsolete below, so that the perithecium is in fact hardly more than a shield-like disk covering the asci.

SPHÆRELLA INCISA, E. & M.—On dead petioles of *Sabal serrulata*. Perithecia membranaceous, gregarious, globose or depressed-globose, $\frac{1}{4}$ mm., covered by the blackened epidermis. Asci lanceolate, 100—120 x 8—10 μ , without paraphyses. Sporidia fusiform, attenuated to a bristle-like point at each end, endochrome distinctly divided in the middle, pale yellowish; length, including the bristle-pointed ends, 40—50 μ , width 3—4 μ . The walls of the perithecia are closely adnate to the matrix, and with difficulty separable from it.

OPHIOBOLUS VERSISPORUS, E. & M.—On dead petioles of *Sabal serrulata*. Perithecia scattered or gregarious, covered by the cuticle, lenticular, $\frac{1}{4}$ — $\frac{1}{3}$ mm., covered by the blackened epidermis which is whitened just around the short, obtuse, barely erumpent ostiolum. Asci 70—80 x 8—9 μ . Paraphyses? Sporidia filiform, curved, multinucleate at first but at length of a uniform pale yellow color without nuclei or septa, 60—70 x 2— $2\frac{1}{2}$ μ .

Melanconium Sabal, Cke. is usually associated with this.

DIDYMOSPHERIA SERRULATA, E. & M.—On bleached spots on dead petioles of *Sabal serrulata*. Perithecia as in the preceding species. Asci 100—112 x 10—12 μ , cylindrical with abundant linear paraphyses. Sporidia 1-seriate, hyaline at first and 3—4 nucleate, soon becoming dark brown and 1-septate, 18—20 x 5—6 μ , surrounded with a hyaline envelope at first. The sporidia are much like those of *Anthostomella leucobasis*, E. & M., only longer and 1-septate, and the perithecia are larger and more prominent.

SPHÆRIA (ANTHOSTOMELLA) LEUCOBASIS, E. & M., and *SPHÆRIA SABALENSIOIDES*, E. & M., in Am. Nat., Oct. 1832.—The general appearance of these two species is much the same, but the latter is scattered between the dark blotches on which the former occurs, and the substance of the matrix is not whitened beneath. The sporidia also are uniformly narrower, 4—5 μ , and have a slight apiculus at the lower end (sometimes at both ends) separated from the body of the sporidium by a slight division of the endochrome but finally absorbed; they are also subhyaline with a yellowish tint in all the specimens examined, though it is not

improbable that they may finally become brown. This species occurs on some of the specimens with no. 1199, N. A. F.

It is not improbable that *Sphaeria sabalicola*, E. & M., l. c., is the same as the *S. sabaligera*, B. & C., though the sporidia are only about half the length given for that species.

HETEROSPORIUM ALLII, E. & M.—On withered leaves of *Allium vineale*, Newfield, N. J., Aug. 1883. Hyphæ erect, subcontinuous, nodulose, olive-brown, about $50 \times 9 \mu$. Conidia oblong, fuscous, minutely echinulate, 1—3-septate, $20\text{--}33 \times 9 \mu$. Differs from *H. Ornithogali* in its olivaceous color and smaller conidia.

SEPTORIA PYROLÆ, E. & M.—On living leaves of *Pyrola secunda*, Red Rock, Lake Superior, June, Prof. J. Macoun, no. 20. Appears at first in the form of little yellowish-white pustules scattered over the lower surface of the leaf but visible also above. Soon the little nerve-bounded areas of the leaf, in which these pustules appear, turn brown bordered by the limiting nervelets now turned black, and in place of the yellowish-white pustules appear little black perithecia, opening below and filled with filiform, $25\text{--}35 \times \frac{3}{4} \mu$ spores, obtuse at each end and only slightly curved.

SEPTORIA CONSIMILIS, E. & M.—On cultivated lettuce, Geneva, N. Y., July (Arthur), Newfield, N. J. On brown, dead, rather indefinitely limited spots, $\frac{1}{2}$ —1 cm. in diameter. Perithecia, brown, subglobose, innate, amphigenous, $90\text{--}100 \mu$, scattered over the spots and visible on both sides of the leaf. Spores filiform, multinucleate, slightly curved, ends mostly obtuse, $30\text{--}45 \times 2\text{--}2\frac{1}{2} \mu$, hyaline. Differs from *S. Lactucæ*, Pass, in growing chiefly on spots, perithecia also a little larger and spores a little longer but not distinguishable by its spores alone.

PHYLLOSTICTA GORDONIÆ, E. & M.—On living leaves of *G. lasianthus*, March. Spots dark brown, dry, occupying the ends and sides of the leaves. Perithecia brown-black, subglobose, innate, slightly erumpent, amphigenous, $120\text{--}140 \mu$. Spores hyaline, oblong, nucleate, $12 \times 3 \mu$.

PHYLLOSTICTA PERSEÆ, E. & M.—On living leaves of *Persea Carolinensis*, March. Spots brownish-gray, covering the ends and sides of the leaves. Perithecia brown-black, lenticular, innate-erumpent, epiphyllous, $150\text{--}300 \mu$ long, $60\text{--}80 \mu$ broad. Spores oblong, hyaline, nucleate, $3\text{--}8 \times 1\text{--}3 \mu$. This and the preceding species with *P. terminalis* E. & M., and *P. Myricæ*, Cke., were collected in the same locality, and, from the similarity in their mode of growth and the not very striking difference in their other characters, they might be considered as varieties of the same thing; this, however, is a question that can not be definitely determined without knowing the ascigerous forms to which they all probably belong.

PESTALOTZIA PEREGRINA, E. & M.—On dead leaves of *Prinus Austriaca*, still hanging on branches cut off last year, Newfield, N. J., May 1885. Acervuli hysteriform, covered at first, then partially erumpent.

Spores oblong-elliptical or obovate, 4-septate with a short, narrower, subconical, hyaline cell at each end, intermediate cells brown. Crest of 3 hyaline, spreading bristles about 7—10 μ long. Basidia about as long as the spore, slender. Colored part of the spore 12—16 x 6—7 μ . Differs from *P. funera*, Desm., in its constantly smaller spores.

ASTERINA DISCOIDEA, E. & M., in Am. Nat. This occurs also on leaves of *Olea Americana*, not differing specially from the form described on leaves of *Quercus laurifolia*. It may be that this is the *A. oleina*, Cke.. Grev. XI, p. 38. The description there given is not inconsistent with this supposition. In that case, *A. discoidea*, E. & M., is a synonym of *A. oleina*, Cke. Unfortunately, the specimen of this latter species in Rav. F. Am., no. 757, in our copy, does not show even a perithecium.

MICROSPHERA DENSISIMA, Schw.—What appears to be this species was found on leaves of *Quercus laurifolia*, at Green Cove Springs, in January and February, 1885. Mycelium thick, gray, persistent, confined to definite spots on the lower surface of the leaf, 8—10 mm. in diameter. Perithecia black, globose, then depressed, 120 μ . Appendages stout, continuous and subhyaline, twice dichotomous, ultimate divisions curved. 96—120 x 7 μ . Asci 6. Sporidia 6—8, oval, granular and nucleate, 21—25 x 12 μ . The branched tips of the appendages are often of a pyramidal shape, the main axis running through and bearing a second set of branches shorter than the first.

NEW NORTH AMERICAN FUNGI.

BY DR. G. WINTER, LEIPZIG, GERMANY.

SPHÆRELLA EARLIANA, Winter.—Perithecia amphigena, densissime stipata, greges parvos, angulato-rotundatos, ca. 1—2 mm. latos. nigros formantia, minutissima, globosa, poro simplici pertusa, atra, 60—70 μ diameter. Asci fasciculati, e basi subventricosa sursum parum attenuati, brevissime stipitati, 8—spori, 26—30 μ longi, 7 μ crassi. Sporæ inordinatæ, clavatæ, medio uniseptatæ, non constrictæ, hyalinæ, 8 μ longæ, 2 μ crassæ. Paraphyses desunt.

On cultivated strawberries, Anna, Ills., May 2d, 1882, Leg. F. S. Earle. Differs from *Sphaerella Fragariæ* (Tul.) especially in its small asci and sporidia.

FUSICLADIUM EFFUSUM, Winter.—Cæspites hypophylli, plerumque minuti, rotundati, rarius effusi, confluentes, sine macula, fumosi. Hyphæ erectæ, simplices vel parum ramosæ, septatæ guttulatæque. valde torulosæ, fuscae, apicem versus dilutiores, 100—140 longæ x 4 μ crassæ. Sporæ oblongo-fusoidæ, fere rhomboideæ, continuæ vel uniseptatæ, dilutissime fuscescentes, utrinque subtruncatæ, 17—24 μ longæ, 5½—7 μ crassæ. On leaves of *Carya alba*, Cobden, Ills., October 1st. 1882. Leg. F. S. Earle.

DARLUCA INTERSEMINATA, Winter.—Perithecia gregaria s. dense sparsa, superficialia, punctiformia, globosa, demum collapse, poro pertusa, membranacea, fusca, 80—130 μ diameter. Sporæ oblongæ s. oblongo-cylindraceæ, utrinque rotundatæ, hyalinæ, uni-(rarissime bi-) septatæ, ad septum vix vel perparum constrictæ, 12—14 μ longæ, 3 μ crassæ. On leaves of *Stellaria* with *Peronospora Alsinearum*, Casp.

DOASSANSIA DECIPIENS, Winter.—Acervuli epiphylli, greges minutos, rotundatos irregularesve, interdum confluentes, pallide fusco-luteos, in macula indeterminata, luteola insidentes, 1—5 mm. diameter, metientes, formantes, punctiformes, rotundati seu elliptici, plerumque dense stipati, non raro confluentes, fusci, immersi, 100—200 μ lati, e sporis numerosissimis, densissime conglobatis, a tegumento tenuissimo, pseudo-parenchymatico, e cellulis minutissimis, fuscis contexto, dense applicato, undique circumdati. Sporæ rotundato-polygoniæ, isodiametricæ (sit venia verbo!) vel subellipticæ, sæpe irregulares, pallide fusciculæ, læves, 10—16 μ diam. in planta adhuc viventi germinantes. Sporidia filiformia, tenuissima, sæpe flexuosa, usque 70 μ longæ, vix 1 μ crassæ. On leaves of *Limnanthemum lacunosum*. Leg. E. A. Rau., Green Pond, Morri Co., N. J., Aug. 1883. This is a very interesting but doubtful species.

SUPPLEMENTARY NOTES ON RAMULARIA.

Whether the mycelium in *all* the species spreads through the intercellular spaces of the leaf, cannot perhaps be positively stated, but this is very plainly the case with some. In *R. Tulasnei*, Sacc., the creeping threads of mycelium among the inner cells of the leaf are very noticeable. The fertile hyphæ also often burst out from little pustules, like the young pustules of some uredo, and sometimes apparently they are quite superficial.

RAMULARIA MACROSPORA, Fres. var. *Senecionis*, Sacc.—On leaves of *Aster Novæ Angliæ*, Wis. (Trelease.) To the naked eye resembling the conidia of *Entyloma Compositarum*, Farl. Conidia colorless, 1—4-celled, usually 2-celled, oblong ovoid, slightly truncate at the pointed extremities, sometimes narrowed gradually to the septum, 20—40 x 5—6 μ . This species which should have been included with the others in the June No. of the JOURNAL was overlooked. The description is copied from the Prelim. List of the Parasitic Fungi, Wis., p. 13.

RAMULARIA CRYPTA, Ck. Grev. XII, p. 27.—The description of this species which was overlooked (see p. 82 of this Journ.) is given below:

“Hypophyllous, covered by the tomentum of the leaf. Hyphæ thick (crassæ), simple, short. Conidia cylindrical, obtuse at each end, straight or slightly curved, hyaline, 25—30 x 6 μ .”

NEW GENERA OF NORTH AMERICAN FUNGI.

The following new genera of North American Fungi have been published by Saccardo.

HYSTEROMYXA, Sacc. & Ell., Mich., II, p. 574.—Perithecia membranaceous, superficial, depressed, oblong or subangular, bright colored. dehiscencerimose or substellate, texture irregularly cellular, thin, covered with a homogeneous, transparent cuticle. Spores abundant, globose bright colored. Basidia not seen. A genus of doubtful affinity; placed by Saccardo in Syll. III, p. 622, among the subcupulate *Sphaeropsidææ*.

H. EFFUGIENS, S. & E.—Perithecia minute, flattened, superficial. dull red, 1-6 mm. in diameter. Spores globose, smooth, 8-10 μ , 3-4 nucleate, subhyaline with a rose-colored tint. Found at Newfield, N. J., on dead foliage of *Cupressus thyoides*, still hanging on the limbs of a tree cut the previous year. Specimens have been distributed in the North Am. Fungi, no. 1221.

PESTALOZZIELLA, Sacc. & Ell., Mich., II, p. 575.—Acervuli subcuticular, without any distinct perithecium. Spores oblong-elliptical. continuous, subhyaline with hyaline bristles at the apex. Differs from *Pestalozzia* in its continuous, nearly hyaline spores.

P. SUBSESSILIS, S. & E. (N. A. F. 1223).—Spots minute, nearly round. amphigenous, faded with a dark margin. Acervuli punctiform, covered by the epidermis, pallid. Spores oblong-elliptical, obtuse at each end. 20-22 x 6½-7 μ , continuous, 2-3 nucleate, subhyaline with an apical. bristle-like appendage dividing into 4-5 branches from near the base and 20-25 μ long by 1 μ thick. The spores appear to be borne on very short. bristle-like basidia. Common on living leaves of *Geranium Carolinianum* at Newfield, N. J., spring and summer.

EVERHARTIA, Sacc. & Ell., Mich. II, p. 580.—Sporodochia verruciform, dark amber color, superficial. Conidia involved in a gelatinous or mucose substance, densely compacted, cylindrical, closely convolute, multiseptate, hyaline. Basidia obsolete. The genus is dedicated to Benjamin M. Everhart, of West Chester, Pa.

E. HYMENULOIDES, S. & E. (N. A. F. 969).—Sporodochia of a dirty amber color, scattered, hemispherical or subelongated, 1-6-1-5 mm. in diameter, compact, superficial. Conidia cylindrical, closely coiled so as to form a flattened, subelliptical mass (18-20 x 16 μ), closely septate or jointed, the segments subcubical, 2-2½ μ in diameter, hyaline but immersed in a yellowish mucose substance. Found on dead leaves of *Sorghum nutans*, at Newfield, N. J., autumn.

An examination at this time (June, 1885) of specimens collected in 1880, shows the coiled spores or conidia to have assumed the appearance of globose or ovate sacks or asci about 15 μ in diameter, containing numerous small (2½-3 x 1½ μ) sporules arranged more or less distinctly in

a spiral manner, and being, in fact, the different sections or joints into which the spirally coiled, cylindrical conidia have separated. Apparently these joints or segments were at first contained in a tubular membrane which has now dissolved, being more evanescent than the membrane enveloping the entire coil, which still persists and appears even more distinct than at first, in the form of a subglobose sack or ascus. In the examination of the fresh specimens the spirally coiled conidia seemed to be attached laterally to upright, simple threads or hyphæ, but we would not be positive of this. The genus is evidently allied to *Cylindrocolla*.

SPIRÆOCREAS, Sacc. & Ell., Mich., II, p. 502.—Sporodochia superficial, globose or hemispherical, compact. Hyphæ or sporophores closely fasciculate, filiform, very long, continuous, simple. Conidia large, globose-ellipsoid, continuous, hyaline, adhering to the sporophores by a long, cuspidate tail or pedicel. A very distinct genus but of doubtful affinity approaching *Aegerita* on one side and *Næmatelia* on the other.

S. PUBESCENS, S. & E.—Sporodochia subglobose, yellowish, (white when fresh), .5—1 mm. in diameter, clothed with acicular, continuous, scattered hairs about $60 \times 2 \mu$. Hyphæ very long, densely radiate, fasciculate. Conidia obovate, $25-30 \times 20-22 \mu$, hyaline, with a single nucleus and covered with a thick (2μ) hyaline membrane and gradually narrowed below into a hyaline cusp or pedicel by which it is attached to the hyphæ or sporophores. Apparently very rare. Found only in a single locality under the roots of an old cedar stump partly overturned, on decaying fragments of wood and wet leaves appearing like a small, white *Peziza* on a speck of white mold. Under this particular stump it has been found sparingly for several years, but nowhere else.

GRANULARIA, Willd. emend.—Sporodochia (peridia?) globose, bright-colored, rather soft, composed of hyphæ and hyaline, filiform sporophores densely, radiately compacted. Spores (conidia?) ovoid, continuous, hyaline, terminal. A genus allied on one side to the *Gasteromycetes*, and on the other to the *Hyphomycetes*, more closely to the latter.

G. EUROTIODES, S. & E.—Sporodochia subglobose, adnate-superficial, $\frac{1}{2}$ — $\frac{3}{4}$ mm. in diameter, pale-yellowish, smooth, subcarnose. Hyphæ densely compacted, filiform, variously subramose, continuous, hyaline, 5μ thick. Conidia ovoid, hyaline, $3\frac{1}{2}$ — $4 \times 2\frac{1}{2} \mu$, acrogenous. On the substance of a broken specimen of *Pachyma cocos*, Schw., lying on the ground, Newfield, N. J., autumn, 1880.

HAINESIA, Ell. & Sacc., Syll. III. p. 698.—Acervuli subcuticular but soon erumpent, pulvinate, minute, phyllogenous, bright-colored, mostly yellowish-red, subtremelloid. Conidia oblong or suballantoid, continuous, hyaline, terminal and lateral, on filiform basidia which are often fasciculately branched.

Dedicated to the late Wm. T. Haines, Esq., of West Chester, Pa., distinguished alike for his legal attainments and his love of Natural Science.

H. RHODINA, Ell. & Sacc.—*Gloeosporium* (?) *rhodinum*, Sacc. Fungi Ital., tab. 1036. Spots hypophyllous, subcircular, fading out with a darker margin. Acervuli innate-emergent, pulvinate, nearly amber color. Conidia subballantoid, somewhat curved, $10-12 \times 3 \mu$. Basidia copiously once or twice branched, $56-60 \mu$ long, branches sometimes verticillate, bacillary, hyaline or yellowish in the mass. In the lower surface of the leaves of *Rhus copallina*, Newfield, N. J., August and September, 1883.

ELLISIELLA, Sacc., n. g., Mich. II. p. 26.—Hyphæ steriles erectæ, simplices, fuscae. Conidia fousoid, with a long, curved beak above.

E. CAUDATA, Sacc., Mich. II. p. 147.—Tufts erumpent, oblong or sublinear, black, minute, $\frac{1}{4}-\frac{1}{2}$ mm. long, $\frac{1}{2}$ mm. wide. Sterile hyphæ erect, cuspidate, rather rigid, continuous, or often distinctly septate, $100-180 \times 7 \mu$, dark-fuliginous, subbulbose at base. Basidia at the base of the hyphæ, subpyriform, subobtuse at the apex, 2-3-spored, $15-20 \times 6 \mu$, very pale olivaceous. Conidia fusoid, slightly curved, $28 \times 5-6 \mu$, hyaline or yellowish, nucleate, attenuated below into a slender, curved base or pedicel, $25-30 \times 1 \mu$.

We agree with the opinion expressed by Prof. Peck, in the 35th Rep. N. Y. State Mus., p. 189, that this genus is not sufficiently distinct from *Colletotrichum*.

NEW LITERATURE.

BY W. A. KELLERMAN.

SACCARDO & BERLESE.—“Miscellanea Mycologica,”

[Continued from page 95.]

SCORIOMYCES, Ell. & Sacc., nov. gen.

Sporodochium amorphous, somewhat waxy, bright colored, arising from the apices of rhizomorphoid fibres, forming a dense net in each subhexagonal area of which are produced the subglobose spores. No hyphæ or basidia seen. An anomalous genus of doubtful affinity.

SCORIOMYCES Cragini, Ell. & Sacc.

Fibres rhizamorphoid, amber-colored, bearing at their extremities orange colored masses of irregular shape, subcontinuous or interrupted and cavernous, bearing some resemblance to a mass of broken down honey comb or “bee bread,” the amorphous masses attached to each other in a subreticulate manner, and bearing the subglobose or subangular, orange-yellow, grumous spores, $16-20 \mu$ in diameter.

On rotten wood of *Rhus venenata*, under the bark, and in the earth and among decaying roots around old stumps, Newfield, N. J. Sent also from Kansas by Prof. F. W. Cragin (no. 148.) Probably not autonomous

but merely an abnormal or undeveloped state of some higher fungus. Compare *Coccospora*, Wallr.

GLÆOSPORIUM SEPTORIOIDES, Sacc. (*Marsonia quercina*, Winter. Hedw. 1884, p. 171.)

Spots determinate, round or irregular, 2—4 mm., occasionally confluent, yellowish brown, with a dark margin. Acervuli generally solitary in the center of the spots, sometimes 2—4 on a spot, covered, slightly elevated, finally collapsing. Spores fusoid, more or less curved, acute at each end, hyaline, nucleolate, endochrome at length indistinctly parted in the middle, $15-24 \times \frac{1}{2}-2 \mu$.

On leaves of *Quercus imbricaria*, Missouri (Demetrio.) On leaves of *Q. coccinea*, Newfield, N. J. This should be placed in *Marsonia*, if that genus is to be retained as distinct from *Glæosporium*, for the mature spores have the endochrome more or less distinctly divided in the middle, often as distinctly so as in *M. Martini*, S. & E., from which this differs in its longer and narrower spores. The appearance of the collapsed acervuli and of the spots is almost exactly the same as that of *Cryptosporium epiphyllum*, C. & E., which is also a closely allied production.

BOTRYTIS PATULA, Sacc. & Berlese.

Tufts minute, whitish becoming yellowish, cottony, suborbicular, fertile hyphæ ascending, continuous, filiform, subhyaline, sending out branches and branchlets nearly at a right angle and forming an imperfect panicle. Conidia large, globose-ellipsoid, 30μ , hyaline or yellowish.

On dead branches of *Rubus strigosus*, Newfield, N. J.

BOTRYTIS CINERELLA, Sacc. & Winter.

Tufts pulvinulate, suborbicular, $1\frac{1}{2}$ mm. diameter or confluent-effused, velutinous, cinereous. Hyphæ fasciculate, ascending, septulate, pale brown below, 2—3 times alternately or oppositely branched, branches acute at the tips. Conidia globose, minute, $4-5 \mu$, subhyaline, terminal.

On bark of *Carya alba*, Missouri, C. H. Demetrio.

CERCOSPORA PULVINULATA, Sacc. & Winter.

Spots amphigenous, suborbicular, rufoferrugineous. Tufts hypophyllous, punctiform arising from a hemispheric, dark-olive cellular base. Hyphæ short, continuous, subdenticulate, simple, pale olive. Conidia bacillary, subobtuse, obsoletely 3-septate, $40-50 \times 3\frac{1}{2} \mu$, pale olive.

On fading leaves of *Morus rubra*, Missouri (Demetrio). The specific name is badly chosen, differing so little from *C. pulvinula*, C. & E.

The following species was overlooked in the Enumeration of Cercosporæ.

CERCOSPORA GLOMERATA, Hark. Bull. Cal. Acad., Feb. 1885, p. 164.

Hyphæ short, springing from a tubercular, stroma-like base. Conidia brown, slightly attenuated upwards, 3—5-septate, $60-70 \times 10-12 \mu$.

On living leaves of *Garrya elliptica*, Tamalpais, Cal., March, 1884 (Harkness.) The parts of the leaf occupied by the fungus soon assume a dry, dead look.

"MUSHROOMS OF AMERICA, Edible and Poisonous," edited by Julius A. Palmer, Jr., published by L. Prang & Co., Boston.

This publication consists of a portfolio of twelve colored lithograph plates, and four printed pages of general directions. "These charts are prepared for popular use, rather than for students of botanical science; all technical terms are, therefore, avoided." Definitions are given of such terms as pileus, gills, veil, ring, volva, etc.; also directions for gathering mushrooms, and characters noted by which one may recognize unmistakably the several poisonous species. Descriptions are given of all the figured species, and directions for cooking the edible ones. It is a handsome work and of general interest. The species figured are as follows: Plate I, *Agaricus campestris* et *arvensis*; plate II, *Coprinus comatus*; plate III, *Marasmius oreades*; plate IV, *Agaricus cretaceus*; plate V, *Agaricus proceus*; plate VI, *Russula heterophylla*, *R. virescens*, *R. lepida*, and *R. alutacea*; plate VII, *Boletus bovinus*, *B. edulus*, *B. scaber*, *B. subtomentosus*, *B. chrysenteron*, and *B. strobilaceus*; plate VIII, *Lycoperdon giganteum*, *L. saccatum*, and *L. gemmatum*; plate IX, *Agaricus vernus*; plate X, *Agaricus muscarius*, *A. phalloides*, and *A. mappa*; plate XI, *Boletus felleus*, *B. alveolatus*, and *B. luridus*; plate XII, *Agaricus semi-orbicularis*, *A. semi-globatus*, and *A. pediades*.

The following was by mistake omitted from the article on NEW FLORIDA FUNGI, by J. B. Ellis and Geo. Martin. It should have appeared on p. 100, in connection with other species of the same genus.

SEPTORIA GRATIOLÆ, E. & M.—On fading leaves of *Gratiola quadridentata*, Florida. Com. Prof. F. L. Scribner. Perithecia punctiform. minute, emergent, scattered over the faded leaves but not in any definite spots. Spores filiform, nucleolate, straight or somewhat curved, continuous, $30-40 \times \frac{3}{4}-1 \mu$.

S. Ludwigiae, Cke., is on definite spots and has thicker spores.

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No. 9.

THE NORTH AMERICAN SPECIES OF GLOEOSPORIUM

BY J. B. ELLIS AND BENJAMIN M. EVERHART.

In this genus which belongs in the *Melanconiceæ*, the spores borne on basidia usually bacillary or acicular and fasciculate, originate in masses (acervuli) beneath the epidermis through which they finally burst in the form of a tendril or globule. The spores, mostly ovate-oblong, are hyaline or nearly so, and are not enclosed in any distinct perithecium. Saccardo in Syll., vol. III, restricts *Gloeosporium* to those species having continuous spores, placing those with uniseptate spores in *Marsonia*, and those having spores with two or more septa in *Septogloëum* but we will here include all under *Gloeosporium*.

A. Spores continuous.

1. GLÆOSPORIUM HAMAMELIDIS, Cke., Grev. XII, p. 26.

Amphigenous. Spots 1 cm. broad, suborbicular, dark brown. Spores subelliptical, obtuse, straight or slightly curved, hyaline, $10 \times 2\frac{1}{2}$ — 3μ .

On leaves of *Hamamelis Virginica*, South Carolina (Ravenel).

2. GLÆOSPORIUM HEPATICÆ, Pk., 33d Rep. N. Y. St. Mus. p. 26.

Spots broad, irregular, often discoloring the whole leaf, dark-brown. Acervuli minute, scattered, epiphyllous, the thick tendrils pinkish when dry. Spores oblong or cylindrical, colorless, obtuse at each end, straight or slightly curved, 15 — $25 \times 6\frac{1}{2}$ — $7\frac{1}{2} \mu$, generally 4-nucleate.

On leaves of *Hepatica acutiloba*, Helderberg Mts., N. Y., July, (Peck.)

3. GLÆOSPORIUM LAPORTEÆ, Pk. l. c.

Spots orbicular, yellowish-green with a dark margined, arid center. Spores simple, globose or elliptical, colorless, 4 — $6\frac{1}{2} \mu$ long, uninucleate or

binucleate, forming a palid globule on the upper surface of the spot.

On living leaves of *Laportea Canadensis*, New York (Peck.)

4. GLÆOSPORIUM ACERIS, Cke., l. c. Rav. F. Am. 525.

Hypophyllous. Spots irregular, cinereo-fuliginous, indefinite, pierced here and there. Spores elliptical, obtuse, hyaline, straight or flexuous, $18 \times 5 \mu$.

On leaves of *Acer rubrum*, South Carolina (Ravenel.)

5. GLÆOSPORIUM NERVISEQUUM, Fekl. Symbolæ Mycol., p. 369, sub Fusario.

Acervuli erumpent, compact, rather prominent, orbicular or sub-elongated, soon becoming nearly black, mostly on the upper surface of the leaf and either on or close along side of the main nerves which are bordered by a narrow, dead, arid, brown strip, a large portion of the leaf, especially the apices of the lobes becoming dead and brown. Spores oblong-elliptical or subovate, hyaline, $8-12 \times 5-6 \mu$, on rather stout basidia, mostly longer than the spores themselves.

On leaves of *Platanus racemosa*. Sent from California by Dr. H. W. Harkness.

This agrees very well with Fuckel's description except that the acervuli in the California specimens can hardly be described as "tuberculis liberis," nor are they for the most part on any "arid spot," but on the nerves themselves. From the small or rather poor specimen in Mycotheca Veneta 1290 it is difficult to form any definite opinion, and the specimen 1595 of the same collection, on young branches of *Platanus*, is, in our copy, a *Cytispora*, having minute ($4-6 \times \frac{1}{2} \mu$) spores on long, slender basidia. It is not therefore absolutely certain that the California specimens are really the same as the *Fusarium nervisequum*, Fekl., but, as we expect to distribute the specimens in N. A. F., some one having access to Fuckel's Fungi Rhenani will be able to decide.

6. GLÆOSPORIUM TRIFOLII, Pk. l. c.

Spots suborbicular, often concentrically zoned, brown. Spores oblong or cylindrical, obtuse, simple, hyaline, $15-23 \times 4-6 \mu$.

On living leaves of *Trifolium pratense*, New York, (Peck.)

7. GLÆOSPORIUM RIBIS (Lib.) Mont. & Desm., Grev. II, p. 83.

Spots orbicular, small, often confluent, brown. Acervuli epiphyllous, covered by the blackened cuticle, whitish within. Spores oblong, curved, $10 \times 5-6 \mu$ (Sacc. in Syll.), subrostrate at the apex, hyaline. In a specimen of *Leptothyrium Ribis*, from Cooke, the spores are mostly $15 \times 6-7 \mu$. We have seen no American specimens, but in Grev. II, p. 83, *Leptothyrium Ribis*, Lib., which is a synonym of this, is credited to New England and Prof. Peck reports it on *Ribes prostratum*, Adirondack Mts., N. Y.

8. GLÆOSPORIUM FAGI (Desm.)

Spots suborbicular, dark brown above, olivaceous below. Acervuli minute, prominent, nearly honey-colored. Spores oblong-ovoid, or sub-rhomboid, $15-20 \times 6-8 \mu$ minutely guttulate, on cylindrical, fasciculate

basidia, nearly half as long as the spore.

On lower surface of *Fagus ferruginea* leaves, Pennsylvania (Dr. Martin.)

9. GLÆOSPORIUM QUERNUM, Hark. Bull. Cal. Acad. Sci., Feb. 1884.

Amphigenous, oozing out in small heaps. Spores hyaline, elliptic or oblong, with 1—3 vacuoles, $12-18 \times 4-6 \mu$.

On leaves and young shoots of *Quercus agrifolia*, in Golden Gate Park, California, in some seasons giving the oaks the appearance of having been scorched by flame.

10. GLÆOSPORIUM SEPTORIOIDES, Sacc., in Miscell. Mycol., ser. II, p. 16. *Marsonia quercina*, Winter, Rabh.-Winter Fungi Eur. 3085.

Spots determinate, round or irregular, often confluent, becoming white above, yellowish or rusty-brown below, 2—4 mm. in diameter, with a narrow dark border. Acervuli hypophyllous, generally one in the center of each spot but sometimes several, scattered, covered, slightly elevated but scarcely visible, at length collapsing. Spores fusoid, nucleolate, curved, acute at each end, hyaline, $14-18 \times 2 \mu$.

On living leaves of *Quercus imbricaria*, Mx., Missouri (Demetrio.) We have not been able to find any septum in the spores.

Var. *major*, on leaves of *Q. nigra* (?) at Newfield, N. J., has the spores $18-23 \times 2 \mu$, endochrome often indistinctly divided in the center. Spots mostly smaller and showing less of the white color above. Acervuli mostly epiphyllous.

11. GLÆOSPORIUM BETULARUM, E. & M., Am. Nat., Dec. 1882, p. 1002.

Spots light-brown, nearly round, 2—3 mm. in diameter, border dark. Acervuli brown, amphigenous, falling out and leaving a dark, cup-shaped cavity, $120-140 \mu$. Spores hyaline, ovate or obovate, $9-10\frac{1}{2} \times 6 \mu$ on very short basidia.

On leaves of *Betula nigra* and *B. lenta*, Sept., Bethlehem, Pa. (Rau), Illinois (Earle).

12. GLÆOSPORIUM ANGULATUM, Cke., Texas Fungi, p. 142. sub Discella.

Gregarious, covered, splitting the epidermis in an angular manner. Spores fusoid-elongated, hyaline, $20 \times 4 \mu$.

On branches of trees, Galveston, Texas.

13. GLÆOSPORIUM LINDEMUTHIANUM, Sacc. & Magnus, Mich. I, p. 129.

Spots on the pods or more rarely on the leaves and stems, subrotund, dark brown when dry, surrounded at first with a rufous border. Acervuli dirty-white, in the center of the spot, raising the epidermis in a pustuliform manner, then erumpent. Spores oblong, straight or curved, rounded at each end, $15-19 \times 3\frac{1}{2}-5\frac{1}{2} \mu$, borne on fasciculate, cylindrical, simple basidia, $45-55 \mu$ long.

On living pods of *Phaseolus* (cult.) Bethlehem, Pa., (Rau) Newfield, N. J. (Ellis,) Wis. (Trelease.)

Dr. Farlow writes that he finds this species common on beans in the Cambridge Market since 1882.

14. GLÆOSPORIUM PUNCTIFORME, Sacc. & Ell., Mich. II, p. 574.

Acervuli loosely gregarious, subcutaneous, fuscous, of medium size ($\frac{1}{2}$ mm. diameter) perforating the epidermis in the center. Spores ovate-oblong, biguttulate, hyaline, $5-6 \times 3-3\frac{1}{2} \mu$. Basidia arising from a proligerous, cellulose, dark straw yellow stratum, acicular, guttulate, hyaline, $15-20 \times 2 \mu$.

On fading leaves of *Phormium tenax*, Philadelphia, Pa. (Dr. Eckfeldt.)

15. GLÆOSPORIUM CINCTUM, B. & C., Grev. III, p. 13.

Acervuli minute, gregarious, surrounded by the blackened epidermis. Spores oblong, obtuse at each end, frequently curved, granular within, $10-15 \times 2\frac{1}{2}-3 \mu$.

On some orchidaceous plant in a hot-house, Massachusetts (Russell.)

16. GLÆOSPORIUM PTERIDIS, Hark. Bull. Cal. Acad., Feb. 1884, p. 32.

Hypophyllous, covering the whole surface, oozing out in large tendrils. Spores hyaline, obovate or elliptical, $10-24 \times 6-10 \mu$.

Distorting the fronds of *Pteris aquilina*, Berkeley, Cal., May, (Hark.)

17. GLÆOSPORIUM VERSICOLOR, B. & C., Grev. III, p. 13.

Spots reticulate, gray, 2-3 cm. broad. Acervuli erumpent. Spores oblong and clavate, hyaline, fuscous, $10-20 \mu$ long.

On apples, So. Ca. (Ravenel.)

18. GLÆOSPORIUM CARPOGENUM, Cke., Grev. VII, p. 102.

Innate, scattered, covered by the cuticle which is at length perforated. Spores elongate-elliptical, hyaline, $13-18 \times 3\frac{1}{2}$, issuing in whitish tendrils,

On fruit of *Æsculus Californica*, Sierra Nevada Mts., Cal. (Harkness.)

19. GLÆOSPORIUM LAGENARIUM, Pass. sub Fusario. Erb. critt. Ital. II, no. 148. Sacc. & Roum., Rev. Mycol. 1880, p. 201. Ell. N. A. F. 950.

Acervuli subcutaneous-erumpent, generally circinating, minute, pulvinate, slightly rose-colored. Spores ovate-oblong, sometimes inequilateral, $16-18 \times 5-6 \mu$, continuous, nearly hyaline, borne on cylindric-fusoid, hyaline, fasciculate basidia, $15-50 \times 3-5 \mu$.

On gourds, Philadelphia, Pa. (Dr. Eckfeldt.)

Whether the *Glæosporium Peponis*, B. & C., in Curtis' Cat. N. C. Plants belongs here we cannot say.

20. GLÆOSPORIUM LEGUMINIS, Cke. & Hark., Grev. IX, p. 7.

Covered, scattered. Spores oval, hyaline, $12 \times 6 \mu$, flowing out in a gelatinous mass.

On legumes, Cal. (Harkness.)

21. GLÆOSPORIUM LEGUMINUM, Cke., Texas Fungi, p. 142, sub Dis-cella, Rav. F. Am. 152.

Acervuli at first covered and pale, becoming nearly black and erumpent, depressed and subhysteriiform, and when well developed, seated on a pallid spot with a reddish, rust-colored border. Spores elliptical or pyriform, 1-nucleate, hyaline, $10-15 \times 4-6 \mu$.

On pods of *Prosopis*, Galveston, Texas (Ravenel.)

As far as can be judged from the brief description, the preceding species is not distinct from this.

22. GLÆOSPORIUM CAPSULARUM, Cke. & Hark., Grev. XII, p. 94.

Gregarious, punctiform, mouth lacerate-cleft. Spores cylindrical, obtuse at each end, slender, straight, continuous, hyaline, $18-20 \times 2\frac{1}{2} \mu$, bursting out in pale, granular globules ("grumulos pallidos.")

On dead capsules of *Eucalyptus*, Calafornia (Harkness.)

23. GLÆOSPORIUM FUSARIOIDES, E. & K., Journ. Mycol. I, p. 3.

Acervuli $\frac{1}{4}-\frac{3}{4}$ mm. in diameter, subcuticular, scattered irregularly or collected in groups, in which case the part of the leaf occupied assumes a dark brownish look. The spores ooze out on both surfaces of the leaf but more abundantly above, being of an oblong-cylindrical shape, $20-30 \times 5-6 \mu$, filled with greenish granular matter and globose nuclei and are borne on elongated cells (basidia) arising directly from the inner surface of the hymeneal cavity.

On fading leaves of *Asclepias Cornuti*, August, Kansas (Kellerman.)

24. GLÆOSPORIUM FRAXINEUM, Pk., 35th Rep. N. Y. St. Mus., p. 137.

Spots numerous, small, pale red with a darker or purplish-red border and usually with a minute, whitish center, nuclei (acervuli) few. Spores oblong-elliptical, colorless, $5-6 \times 4 \mu$, sometimes with a minute nucleus at each end.

On living leaves of *Fraxinus pubescens*, June, Albany, N. Y. (Peck.)

25. GLÆOSPORIUM AFFINE, E. & K., Am. Nat. 1883, p. 1165, sub Phyllosticta.

Spots light rusty-brown of irregular outline, 4—5 mm. with a narrow, dark brown, scarcely raised border. Acervuli amphigenous, pale, $125-200 \mu$ in diameter, mostly situated on or near the nerves of the leaf. Spores oblong, hyaline, $5 \times 1\frac{1}{2} \mu$, on basidia about 6μ long.

On living leaves of *Sassafras*, July, Ohio, (Kellerman.)

26. GLÆOSPORIUM SALICIS, West, Exs. 1269.

Spots amphigenous, dark brown or nearly black, small (1 mm.), often confluent. Acervuli covered, scattered or confluent; cirrhi short, curved, white. Spores oblong, slightly curved, continuous, with a nucleus or oil globule at each end. We have seen no American specimens of this species, but Prof. Peck reports it on leaves of *Salix longifolia*, North Greenbush, N. Y., September, and sends the following note:

"Our specimens have the spores either simple or 2—3-nucleate and generally a little thicker towards one end. In size they are $15-23 \times 7\frac{1}{2}-10 \mu$. Very unlike *G. salicinum*, Pk., which is rather a *Septoglœum*. though the septa are obscure."

27. GLÆOSPORIUM GLOTTIDII, E. & M., n. s.

In the single specimen seen, occupying the dead tip of the pod, the dead portion obscurely limited by a dull purplish border. Acervuli scattered, numerous, nearly black when dry, suborbicular, 250μ in diam. Spores varying from ovate to oblong and cylindrical, 1—3 nucleate, the

longer ones sometimes a little curved, $9-16 \times 3 \mu$, on rather slender basidia which are mostly a little shorter than the spores themselves.

On fruit of *Glottidium Floridanum*, D. C. From Florida, Com. Prof. F. L. Scribner.

28. GLÆOSPORIUM CORYLI (Desm.) *Phyllosticta corylina*, E. & M., in Am. Nat., Dec. 1884.

Spots amphigenous, light brick red, 2–5 mm, or by confluence much larger, often continuous along the margin of the leaf, accurately bounded by a narrow, darker colored border. Acervuli mostly hypophyllous, minute ($90-120 \mu$) becoming nearly black. Spores oblong, $12-15 \times 5-7 \mu$, rounded at the ends and narrower in the middle, usually with two nuclei, borne on short basidia. The spots are much larger than represented in the figure in *Fungi Italici* 1919, but the spores are exactly as there represented. This is certainly not a *Phyllosticta*, as there are no perithecia, though the black acervuli much resemble perithecia. The trees on which this fungus occurs were imported from England. We can not say whether the same thing is found on our native species of *Corylus*.

On living leaves of *Corylus Avallana*, Newfield, July, N. J.

29. GLÆOSPORIUM PHOMIFORME, Sacc. & Ell., Mich. II, p. 574.

Acervuli subgregarious, subcutaneous, fuscous, $\frac{1}{2}$ mm. diameter, perforating the epidermis, in the center. Conidia ovate-oblong, biguttulate, hyaline, $5-6 \times 3-3\frac{1}{2} \mu$. Basidia acicular, $15-20 \times 2 \mu$, guttulate, hyaline, arising from a cellular, dark straw-colored, proligerous stratum.

On leaves of *Phormium tenax* (cult.) near Philadelphia, Pa. (Dr. Eckfeldt.)

30. GLÆOSPORIUM QUERCINUM, West.

In the Canadian Naturalist, X, p. 10, this species is credited to this country by De Thuemen. We have seen no specimens, the only one in our herbarium under this name (*Fungi Gallici* 2884), showing only a spot caused by some larva burrowing under the epidermis.

We copy the following description from Lambotte's *Flore Mycol. Belge*:

"Acervuli hypophyllous, dark reddish-brown, raising the epidermis into pustules and spotting the leaf with dark red-brown. Spores elongated-oval, cirrhi more or less distinctly orange-yellow."

31. GLÆOSPORIUM PHOMOIDES, Sacc. Mich. II, p. 540, F. Ital. tab. 1060.

Prof. J. C. Arthur of the Ag. Exp. Station at Geneva, N. Y., finds on the fruit of tomatoes what he considers to be this species. In the 3d Annual Report of the Station (1884), p. 381, he says of this fungus:

"It corresponds very well with the figure and description of *G. phomoides*, Sacc., and may be identical with it. The fungus develops just beneath and within the epidermis or skin of the fruit, and soon breaks through it and produces great numbers of spores on the ends of the protruding mycelium. To the naked eye, it only roughens the surface of the fruit by the spores and ragged edges of the broken skin, but on cutting open the tomato a firm, whitish mass reveals its extent."

Saccardo, in *Michelia*, describes this species as follows :

“Acervuli innate-erumpent, fuscous, pulvinate. Conidia oblong-clavate, abruptly attenuated below, rounded at the apex, $10-12 \times 2\frac{1}{2}-3 \mu$, biguttulate, hyaline. Basidia bacillary, fasciculate, $20-21 \times 1\frac{1}{2} \mu$, hyaline, arising from a dark, cellulose, proligerous stratum.”

B. Spores uniseptate (Marsonia, Fisch.)

32. GLÆOSPORIUM MELILOTI, Trelease. Prelim. List of Parasitic Fungi of Wis., p. 16.

Acervuli minute, inconspicuous, occurring in longitudinal rows, 2—5 mm. long, on the stem. Spores oozing out in pale, flesh-colored tendrils, colorless under the microscope, oblong, straight or slightly curved, 2-celled, $13-20 \times 5-6 \mu$. In the smaller spores the septum is nearly central; in the larger ones it is nearer one end.

On stems of *Melilotus alba*, Wisconsin (Trelease.)

33. GLÆOSPORIUM POPULI, (Lib.) Mont. & Desm. *Leptothyrium populi*, Lib. *Glæosporium labes*, B. & Br. *G. Berkeleyi*, Mont. (*G. Castagnei*, Mont. ?)

Spots brown, indefinite, often confluent over the greater part of the leaf. Acervuli scattered, epiphyllous, pale. Spores pyriform, hyaline, endochrome divided near the smaller end, $15-20 \times 6-8 \mu$. We have seen no authentic specimens of *G. Castagnei*, Mont., which, see Sacc. in *Mich.* II, p. 119, is very closely allied to this, differing only in its narrower spores. The specimens in N. A. F. 1172, were referred to *G. Castagnei*, Mont., as the measurements of the spores agree with those given by Saccardo in *Mich.*, but on examining the specimens of *G. Populi* (Lib.), in Saccardo's *Myc. Veneta*, no. 1237, we find the spores to be $15-20 \times 6-8 \mu$. The dimensions given in *Michelia*, I, p. 220, are $20 \times 12 \mu$. N. A. F., 1172, is without doubt the same as M. V. 1237. The specimens of *G. Populi* (Lib.) in our copy of *Myc. Ven.* 1291 are different, having larger, dark acervuli and linear or subfusiform spores, $5-15 \times 1\frac{1}{2}-2 \mu$, on stout basidia $10-15 \times 2\frac{1}{2} \mu$.

On leaves of *Populus alba*, Penn. (Martin); leaves of *Populus Fremontii*, Cal. (Harkness.)

34. GLÆOSPORIUM JUGLANDIS, Lib. sub. *Leptothyrio*, N. A. F. 1171.

Spots epiphyllous, suborbicular ($\frac{1}{2}$ cm.) dark cinerous with a rather indefinite border. Acervuli flattened, blackish, rugulose, 200μ in diameter, with a gray nucleus. Spores fusoid, curved, subrostrate at the apex, 1-septate, hyaline, $20-25 \times 5 \mu$.

On leaves of *Juglans cinerea*, Bethlehem, Pa. (Rau), Wis. (Trelease.)

35. GLÆOSPORIUM NEILLIÆ, Hark. Bull. Cal. Acad. Feb. 1884, p. 31.

Epiphyllous, on small, angular, brown spots 2—3 mm. in diameter. Acervuli scattered, small, dark, mostly epiphyllous. Spores hyaline, ovate, straight or slightly curved, obtuse, 1-septate and strongly constricted, $15-20 \times 6-8 \mu$ ($25-30 \times 8 \mu$ Hark.), on crooked, subramose, filiform basidia $30-40 \times 1-1\frac{1}{2} \mu$.

On leaves of *Neillia opulifolia*, Calafornia (Harkness.)

36. GLÆOSPORIUM LONICERÆ, Hark., l. c.

Spots amphigenous, orbicular or irregular, white above with a rusty brown margin, ferruginous below. Acervuli scattered, epiphyllous, round, flat, black, .2 mm. in diameter. Spores clavate, mostly curved, obtuse above, narrowed nearly to a point below, with the septum nearer the narrow ends hyaline, $25-30 \times 6-8 \mu$ ($35-40 \times 7-9 \mu$ Hark.)

On leaves of *Lonicera conjugalis*, Sierra Nevada Mts., Cal. (Harkness.)

37. GLÆOSPORIUM MARTINI, Sacc. & Ell., Mich. II, p. 574.

Spots amphigenous, minute ($1\frac{1}{2}$ mm.), rusty brown. Acervuli mostly a single one in the center of the spot, hypophyllous, $\frac{1}{4}-\frac{1}{2}$ mm. in diameter. Spores subhyaline, fusiform, curved, issuing in amber-colored masses, endochrome divided in the middle, $12-15 \times \frac{1}{2} 2''$, on very short basidia.

On leaves of *Quercus obtusiloba*, Chester Co., Pa. (Dr. Martin.) *G. septorioides*, Sacc., scarcely differs from this except in its longer spores.

38. GLÆOSPORIUM POTENTILLÆ (Desm.) Ouds.

Spots epiphyllous, purplish-red when fresh, fading out when dry, subcircular, small. Acervuli covered, lenticular, pale, becoming nearly black, scattered, small. Spores oblong-clavate, or fusoid-clavate, the upper half curved to one side and subrostrate, $15-22 \times 4-6 \mu$ ($20-25 \times 7-9 \mu$, Sacc. in Syll.), edochrome distinctly once divided, hyaline, on very short basidia.

On living leaves of *Fragaria* (cult.), Pa. (Martin), Ills. (Earle.) On *Potentilla Anserina*, Cal. (Harkness.) Probably common throughout the country.

39. GLÆOSPORIUM TOXICODENDRI, E. & M., n. s.

Spots amphigenous, dirty white, small (2 mm.) with a rather broad, nearly black border. Acervuli scattered, not numerous, dark colored. Spores oblong, 1-septate, $12-15 \times 5-6 \mu$.

On living leaves of *Rhus Toxicodendron*, Charles City, Iowa, Sept. Coll. Prof. J. C. Arthur.

40. GLÆOSPORIUM QUERCUS, Pk. (in literis.)

Spots amphigenous, suborbicular, 4-6 mm., definite. Acervuli hypophyllous, scattered, rather numerous. Spores oblong-cylindrical, 1-septate, straight or slightly curved, constricted more or less in the middle, ends subobtuse, $12-15 \times 2-2\frac{1}{2} \mu$, oozing out in amber colored masses. Allied to *Marsonia Martini*, S. & E., and *M. Quercina*, Winter, but differs in its more numerous acervuli and mostly rather shorter spores.

On living leaves of *Quercus ilicifolia*, N. Y. (Peck.)

41. GLÆOSPORIUM OCHROLEUCUM, B. & C., sub Septoria, Grev. III, p. 9. *Cryptosporium epiphyllum*, C. & E., Grev. VII, p. 37. N. A. F. 533.

Spots small (2-3 mm.), pale, surrounded by a narrow, dark margin. Acervuli innate, pale, few (1-5) or often only one in the center of the spot, opening mostly below. Spores crescent shaped with the ends subobtuse, $20-25 \times 2\frac{1}{2}-3 \mu$, continuous at first but endochrome finally

divided in the middle, arising from the pointed apices of the cells forming the proligerous layer and oozing out in an amber-colored mass. In old specimens, emptied of spores, the places of the acervuli are marked by little cup-shaped cavities. All the characters of this fungus point to *Glæosporium*, and we place it there without hesitation.

On *Castanea vesca*, Newfield, N. J.

If we accept *Marsonia* as a genus distinct from *Glæosporium*, then this production must, in different stages of its growth, belong to two distinct genera. In our opinion, it is much better to regard *Marsonia* and *Septoglæum* as mere sections of *Glæosporium*; or, if they are to be regarded as distinct, they should in a systematic arrangement, stand consecutively, and not be separated by intervening genera.

C. Spores 2-or-more septate (*Septoglæum*, Sacc.)

42. GLÆOSPORIUM ANGELICÆ, Cke., Grev. VII, p. 34.

Spots fuscous, various. Acervuli gregarious, round, scarcely prominent. Spores cylindric-clavate, nucleate, at length biseptate, hyaline, $40-60 \times 8 \mu$.

On fading leaves of *Archangelica*, South Carolina (Ravenel).

43. GLÆOSPORIUM NUTTALLII, Hark. l. c.

Spots epiphyllous, reddish-brown, 2-5 mm. in diameter, suborbicular and rather indefinitely limited. Acervuli, gregarious, often circinate, more distinctly visible on the lower face of the leaf, but discharging the spores in flesh-colored masses, more abundantly above. Spores cylindrical or clavate cylindrical, subhyaline, 1-5-septate, mostly 1-septate, with a row of nuclei, broader and more obtuse at the apex, $45-75 \times 3-4\frac{1}{2} \mu$ ($36-45 \times 4-5 \mu$. Hark.)

On leaves of *Nuttallia cerasiformis*, California (Harkness.)

44. GLÆOSPORIUM FRAXINI, Hark. l. c.

Spots epiphyllous, minute, whitish, light rusty-brown when dry, angular and irregular, 4-10 mm. diameter. Acervuli epiphyllous. Spores cylindrical, mostly irregularly bent or curved, 2-5-septate, $20-40 \times 3-3\frac{1}{2} \mu$, mostly $25-35 \times 3 \mu$ ($16-24 \times 4-5 \mu$ Hark.) issuing in pale, flesh-colored masses. The spots are scarcely visible below but are very abundant above, giving the leaf a mottled appearance.

On living leaves of *Fraxinus Oregana*, California (Harkness.)

45. GLÆOSPORIUM MACULANS, Hark., l. c.

Spots epiphyllous, circular, dark, $1-1\frac{1}{2}$ cm., or often occupying one-half or more of the leaf, rather indefinitely limited, radiate, fibrous. Acervuli hypophyllous, small, gregarious or scattered. Spores oblong-fusoid or subcylindrical with one end pointed and curved and the other rounded-obtuse, endochrome, 1-5 times divided, $30-50 \times 6-9 \mu$. The leaves are also discolored on the lower surface. The radiate-fibrous structure on the upper surface of the leaf is peculiar.

On leaves of *Salix lasiolepis*, California (Harkness.)

We have seen no specimens of *Septoglæum salicinum*, Pk., which may not be sufficiently distinct from this.

43. *GLÆOSPORIUM SALICINUM*, Pk. 33d Rep. N. Y. St. Mus., p. 26.

Spots large, irregular, indefinite, arid, pale. Spores elongated, subfusiform, curved or flexuous, obscurely triseptate, each cell usually containing 2 nuclei, colorless, 40—50 μ long. Usually one end of the spore is more acute than the other."

On living leaves of *Salix sericea*, N. Y. (Peck.)

In the character of its spores this species seems to approach *Septoria*, but nothing is said in the description above quoted, of *acervuli* or *perithecia*. [EDS.]

47. *GLÆOSPORIUM APOCYNI*, Pk., 34th Rep., N. Y. St. Mus., p. 45.

Spots few, large, irregular, brown or blackish-brown. Acervuli few. Spores large, subcylindrical, rounded at the ends, hyaline, 40—50 \times 7 $\frac{1}{2}$ μ and 3—7-septate, each cell nucleate.

On living leaves of *Apocynum cannabinum*, Sept., N. Y. (Peck.)

The spots at length become thick, brittle and almost black, and the surrounding tissue fades to a yellowish hue. The septa of the spores are not always distinct but the nuclei are plainly visible. The general appearance is much the same as that of *Phyllosticta Apocyni*, E. & M., but the fruit is very different.

Not having specimens of several of the species enumerated, we could only copy the descriptions, but we have carefully examined all those of which specimens were accessible to us.

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ERRATA.

On page 85, 16th line from bottom, for *Nardosmii*, read *Nardosmia*.

On page 100, 3d line from bottom, for *Prinus*, read *Pinus*.

On page 102, after the article "Supplementary Notes on Ramularia.

the names of Messrs. Ellis and Everhart should have been given.

On page 101, 21st line from bottom, instead of *on*, read *or*.

On page 105, 21 line from top, for 1036, read 1035.

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No. 10.

FUNGI NOVI MISSOURIENSES.

AUCTORE DR. G. WINTER.

Fungi omnes hic descripti a Rev. C. H. Demetrio, amico meo æstimatissimo, circa Perryville, Perry Co., Mo., lecti sunt.

SPHÆRELLA DESMODII Winter nova species.—Perithecia epiphylla, in maculis magnis, valde irregularibus, arescendo-griseis fuscidulisve, margine obscuriori, determinato, varie flexuoso et sinuato circumdatis gregaria, minuta, hemispherica, poro simplici pertusa, atra, 70—90 μ diam. Asci oblongo-cylindracei, sursum parum attenuati, vertice rotundati, sessiles, 8-spori, 35—40 μ longi, 6—7 μ crassi. Sporae distichae, cymbiformes s. fusoidae, saepe plus minusve curvatae, medio uniseptatae, sed non constrictae, hyalinae, 10.2—12 μ longae, 2.5—3.5 μ crassae.

Ad *Desmodii canescentis*, D. C. folia viva, Aug. 1883.

DIDYMOSPHERIA PHYLLOGENA Winter nova species.—Perithecia in macula rotundato-angulata vel irregulari, fusca, linea atra cincta, determinata, usque 8 millim. diam., hypophylla, immersa, epidermidem perforantia, punctiformia, tenuissime membranacea, ca. 100 μ diam. Asci clavati, brevissime pedicellati, 8-spori, 50—70 μ longi, 9—11 μ crassi. Sporae distichae (rarius submonostichae), oblongae, inaequilaterales, utrinque alternatae, bicellulares, ad septum constrictae, fuscidulae, 14—16 μ longae, 5 μ crassae. Paraphyses crassae, cylindraceae, septatae.

Ad folia delapsa *Liriodendri tulipiferae* L. October, 1883.

DIATRYPE ROSEOLA Winter nova species.—Stromata sparsa v. subgregaria, disciformia, orbicularia v. parum irregularia, non raro confluentia, plana vel parum convexa, erumpentia, lateribus ab peridermii fissi laciniis erectis cincta, 1.5—2.5 millim. lata superne sordide pallidissimaque rosea, demum nigricantia, rimulosa, intus albida. Perithecia in singulo stromate ca. 12—30, dense stipata, elliptica, ostiolis sublongia tenuibus, obtusissimis vix vel non prominulis, radiatim 4—5 sulcatis prae-

dita. Asci anguste oblongi, longissime pedicellati, 8-spori, 50—60 μ longi (pars sporif.), 7 μ crassi. Sporae conglobosae, cylindraceae, parum curvatae, fuscae, 12—14 μ longae, 2.5—3 μ crassae.

Ad ramos aridos *Quercus tinctoriae* Bartr., April, 1883.

Ascis sporidiisque majoribus a *Diatrype disciforme*, ostiolis minoribus, non vel vix prominulis. sporidiis crassioribus, a *D. asterostoma* valde diversa.

SEPTORIA BACILLIGERA Winter nova species.—Maculae parvae, angustae vel irregulares, interdum confluentes plerumque 1 millim. diam., candidae exaridaeque, linea atra cinctae. Perithecia sparsa, minutissima, globosa, membranacea, poro pertusa, atra, 80—90 μ diam. Sporae numerosissimae, bacilliformes, saepe uno apice parum incrassatae, 1—3 septatae, demum ad septa constrictae, hyalinae, plerumque rectae, 9—23 μ longae, 3—3.5 μ crassae.

Ad *Ambrosiae trifidae*, L. folia viva, October, 1883.

SEPTORIA TENUISSIMA Winter nova species.—Maculae minutae, rotundato-angulatae, $\frac{1}{2}$ —1 $\frac{1}{2}$ millim. latae, arescendo-candidae, linea elevata. fusco-atra circumdatae, area indeterminata, viridi-fusca cinctae. Perithecia sparsa, plerumque epiphylla. punctiformia, globosa, atra, poro pertusa, 60—70 μ diam. Sporae tenuissime filiformes, non distincte septatae, saepe flexuosae, hyalinae, 20—28 μ longae, 1 μ crassae.

Ad *Boehmeriae cylindricae*, Willd. folia viva, September, 1883.

SEPTORIA INFUSCATA Winter nova species.—Maculae magnae, rotundatae v. irregulares, sordide griseae, saepe variegatae et subzonatae, area perlata, fusca, indeterminata cinctae, usque 20 millim. longae, 6 millim. latae. Perithecia sparsa gregariave, prominula, globosa, atra, tenuissime membranacea, 87—105 μ diam. Sporae filiformes utrinque rotundatae, sursum perparum incrassatae, multiseptatae, hyalinae, 50—70 μ long, 1.5—2 μ crassae.

Ad *Lepachidis pinnatae*, Torr. et Gr. folia viva, Juli, 1883.

SEPTORIA MIMULI Winter nova species.—Maculae sparsae vel gregariae, rotundatae angulataeve, interdum irregulares et confluentes, arescendo-albidae, griseo- vel sordide-fuscescentes, margine lato, distincto, purpureo vel fusco, et area indeterminata, fuscescenti cinctae, $\frac{1}{4}$ —3 millim. latae. Perithecia solitaria vel parca, punctiformia, atra, globosa, 60—90 μ lata. Sporae cylindricae, utrinque attenuatae, remote septatae, hyalinae, curvatae, 35—45 μ longae, 2.5 μ crassae.

Ad folia viva *Mimuli ringentis* L., August, 1882.

SEPTORIA CIRRHOSA Winter nova species.—Maculae sparsae vel confluentes, subrotundatae s. irregulares, submagnae, pallide fuscidulae, centro saepe palliores, area lata, luteola circumdatae, indeterminatae usque 7 millim. latae. Perithecia amphigena, laxo gregaria, semiimmersa, depresso globosa, poro late pertuso, atra, 100—130 μ diam. Sporae cylindraceo-filiformes, saepe flexuosae curvataeve, utrinque acutae, chlorino-hyalinae, plerumque 3—5-septatae, 30—45 μ longae, 2—2.5 μ crassae, cirrhose excipulae.

Ad folia viva *Staphyleae trifoliae*, L., August, 1882.

SEPTORIA UNICOLOR Winter nova species.—Maculae angulosae vel rotundatae, olivacae, plerumque determinatae, rarius indeterminatae, concolore marginatae, usque 5 millim. magnae, sed plerumque minores. Perithecia epiphylla, minutissima, sparsa, globosa, tenuissime membranacea. Sporae filiformes, saepe flexuosae, hyalinae, non vel vix visibile septatae, 26—32 μ longae, vix 1 μ crassae.

Ad folia viva *Mulgedii acuminati* DC., Juni, 1883; a *Septoria Mulgedii* Thuemen et aliis speciebus in Compositis lectis valde diversa.

PHYLLOSTICTA CIRCUMVALLATA Winter nova species.—Maculae rotundato-augustatae, griseae, linea fusco-atra, elevata circumscriptae, ca. 5 millim. diam. Perithecia sparsa, plerumque epiphylla, lenticularia, atra, membranacea, 100—120 μ diam. Sporae ellipticae, utrinque acuminatae, 7—9 μ longae, 3½—4 μ crassae, nucleis 2 magnis praeditae, hyalinae, continuae.

Ad folia languida *Liriodendri tulipiferae* L., autumn, 1883.

PHYLLOSTICTA SANGUINARIAE Winter nova species.—Maculae sparsae, rotundatae vel parum irregulares, determinatae, arescendo-griseae vel albiae, margine distincto, fusco-purpureo, ambitu linea elevata, fusco-atra limitatae, area indeterminata, lata, fuscidula circumdatae, 1—5 millim. latae. Perithecia epiphylla, gregaria, erumpentia, punctiformia, globosa, atra, ca. 100 μ diam. Sporae numerosissimae, elliptico-oblongae, saepe uno apice parum attenuatae, hyalinae, 5—7 μ longae, 1.5—2.5 μ crassae.

Ad folia viva *Sanguinariae Canadensis* L. Mai, 1884.

CHÆTOPHOMA MACULANS Winter nova species.—Perithecia minuta, globosa, pora pertusa, fusca, membranacea, 70 μ diam., in macula rotundata vel subirregulari, magna (usque 25 millim. lata,) fusca, demum fusco-atra, margine indeterminata, pallidiore cincta, interdum autem a linea atra, limitata, amphigena, superficialia, mycelia repente, ramoso, septato, fusco, subdensa insidentia. Sporae numerosissimae, et minutissimae, ellipticae, hyalinae, unicellulares, vix 2 μ longae.

Ad folia viva languida *Silphii terebinthacei* L., autumn, 1883.

LIBERTELLA GLEDITSCHIAE Winter nova species.—Acervuli difformes immersi, intus pallidi, linea atra circumdati. Sporae in cirros plerumque filiformes, contortos, aurantiacos erumpentes, filiformi-fusoidae, valde curvatae, tenuissimae, hyalinae, 17—25 μ longae, vix 1 μ crassae.

Ad corticem putridum *Gleditschiae Triacanthi* L., Januar, 1884.

CYLINDROSPORIUM CIRCINANS Winter nova species.—Acervuli epiphylli, magni, plerumque circinatum vel concentricum stipati, rarius inordinate gregarii, rotundato-angulati vel irregulares, saepe confluentes. orbes vel maculas usque 15 millim. latos, fusco vel sordide-griseas formantes, margine elevato obscuriori varie flexuoso circumdati, applanati. Sporae cylindrico-fusiformes, utrinque acutiusculae, parce septatae, hya-

linae, saepe flexuosae, 20—30 μ longae, 1.5 μ crassae.

Ad *Sanguinariae Canadensis*, L. folia viva, Mai, 1884.

ELLISIELLA MUTICA Winter nova species.—Caespituli miniori, punctiformes, atri, in maculis fuscis, rotundatis vel irregularibus, area luteola lata, indeterminata cinctis, centro demum arescendo-griseis, 5—12 millim. diam., hypophylli, sparsi. Hyphae steriles erectae, sursum attenuatae, saepe subflexuosae, parce remoteque septatae, basi plus minusve incrassatae, fuscae, 70—96 μ longae, 3.5 μ crassae. Basidia brevo cylindrica, apice rotundata, pallidissime olivacea, 14—16 μ crassae. Basidia brevo cylindrica, apice rotundata, pallidissime olivacea, 14—16 μ longae, 3.5 μ crassae. Sporae fusioideae, curvatae, continuae, guttulae, chlorinohyalinae, utrinque acutae, 26—30 μ longae, 3.5 μ crassae.

Ad folia viva *Silphii laevigati*, Ell., August, 1883.

CERCOSPORA CATALPÆ Winter nova species.—Maculae rotundatae vel angulatae, demum irregulares, in pagina foliorum superiore arescendo-griseae vel albidae, fusco-cinctae, in pagina inferiore griseae seu centro pallescente-albidae, usque 4 millim. latae. Caespites hypophylli, sparsi, oculo nudo non conspicui. Hyphae fasciculatae, e stromate pulviniformi, fusco, minuto ortae, erectae, torulosae interdum parce romosae, fuscae, sursum pallidiores vel hyalinae, remote septatae, usque 70 μ longae. Sporae longissime obclavatae, infra mediam latissimae (usque 5 μ) basin versus perparum, sursum vero maxime attenuatae, saepe curvatae, septatae, hyalinae, usque 75 μ longae.

Ad folia languida *Catalpae bignonioides*, Walt. October, 1883.

CERCOSPORA ANGULATA Winter nova species.—Maculae rotundato-angulatae, arescendo-albidae vel cinereae, margine distincto, lato, fusco-atro cinctae, 1—3 millim. latae, interdum confluentes. Caespituli plerumque hypophylli, sparsi, minutissimi, fusci. Hyphae fasciculatae, erectae, non vel parum torulosae, simplices, fuscae, remote septatae, 78—105 μ longae (raro longiores), 5—5.5 μ crassae. Sporae filiformi-obclavatae, sursum longissime attenuatae, hyalinae, 7—16-septatae, 80—170 μ longae, 3.5 μ crassae.

Ad folia viva *Philadelphii coronarii*, L., August, 1883.

CERCOSPORA ALBIDOMACULANS Winter nova species.—Maculae dense sparsae, minutae, rotundatae, angulatae, vel irregulares, arescendo-albidae s. griseae, margine angusto, determinato, fusco-atro limitatae, $\frac{1}{2}$ —3 millim. latae. Hyphae fasciculatae, caespites minutissimos, gregarios, fusciculos formantes, erectae, torulosae et minute dentatae, interdum parce ramulosae, septatae, fuscae, 45—70 μ longae, 5 μ crassae. Sporae filiformi-obclavatae, i. e., e basi parum incrassata sursum longissime attenuatae, pluri-septatae, hyalinae, usque 96 μ longae, 3.5—4.5 μ crassae.

Ad folia viva *Ricini communis*, L., autumnus, 1883.

CERCOSPORA VARIICOLOR Winter nova species.—Maculae magnae, primo orbiculares, demum irregulares, centro griseae, margine latissimo,

distincte limitato, pallide sordidique, fuligineo vel cervino, zonis pluribus concentricis griseis notato circumdatae, 10—25 millim. latae. Caespituli epiphylli, dense sparsi, atri, minutissimi. Hyphae fasciculatae e tuberculo minuto, hemispherico, pseudoparenchymatico, fusco oriundae, erectae, torulosae, plerumque simplices, fuscae, parce septatae, 35—53 μ longae, 3.5 μ crassae. Sporae filiformes, deorsum parum longaeque incrassatae, usque 87 μ longae, 3.5 μ crassae, pallide olivaceae, parcissime septatae, minute guttolatae.

Ad folia viva *Paeoniae officinalis*, L., August, 1883.

CERCOSPORA CAULICOLA Winter nova species.—Caulicola. Maculae plus minusve elongatae, non raro caulem circumdantes, saepe confluentes, centro sordide luteolae vel griseae, margine lato fusco vel fusco atro. et area indeterminata, latissima, luteola cinctae, 1—3 millim. longae. Caespites in centro maculorum gregariae, minutae, erumpentes, atrae. Hyphae caespitosae, e tuberculo magno, fere globoso, sphaeriaeforme, pseudoparenchymatico, fusco oriundae, erectae, torulosae, simplices, parcissime septatae, fuscae, usque 50 μ longae, 4—5 μ crassae. Sporae fere aciculares, sursum attenuatae, deorsum perparum incrassatae, basi truncatae, triseptatae, hyalinae, usque 45 μ longae, 2.5 μ crassae.

Ad *Asparagi officinalis*, L. caules ramulasque vivas, autumn, 1883.

CERCOSPORA PTELEÆ Winter nova species.—Maculae sparsae, minutae, rotundato-angulatae, centro arescendo-albidae, late et indeterminate fusco-atro cinctae, area lata, luteola circumdatae, ca. 2—3 millim. (sine area) latae. Caespites hypophylli, dense stipati, demum saepe confluentes, olivacei. Hyphae caespitosae, erectae, simplices vel pluriseptatae, usque 130 μ longae, 5 μ crassae. Sporae obclavato-cylindratae, sursum longe, sed parum attenuatae, 3—4-septatae, ad septa saepe constrictae, olivaceae, usque 90 μ longae, 6 μ crassae.

Ad folia viva *Pteleae trifoliatae*, L. Juni, 1885.

CERCOSPORA AFFLATA Winter nova species.—Sine macula. Caespites tenuissimi plerumque hypophylli, effusi, indumentum tenuissimum, saepe indeterminatum, rarius limitatum, olivaceum formantes, interdum, confluentes et partes majores folii obducentes. Hyphae fasciculatae, erectae, simplices, valde torulosae et dentatae, fuscae parce septatae, usque 160 μ longae, 3.5 μ crassae. Sporae longissime cylindricae, sursum perparum (interdum vix) attenuatae, pallidissime olivaceae, pluriseptatae et multiguttolatae, usque 110 μ longae, 5 μ crassae.

Ad folia viva *Pteleae trifoliatae* L., September, 1883; a praecedente valde diversa et facile distinguenda.

CERCOSPORA AVICULARIS Winter nova species.—Maculae sparsae, minutae, rotundato-irregulares, griseae vel fusciculatae, margine determinato, atro-purpureo, angusto cinctae, 1—3 millim. latae. Caespites epiphylli, numerosissimi, gregarii, minutissimi, fusci. Hyphae fasciculatae, erectae, sursum parum torulosae et denticulatae, fuscae, 26—35 μ longae, 3.5 μ crassae. Sporae elongato-obclavatae, septatae, sursum

parum angustatae, pallide fuscidulae, usque 50 μ longae, 3.5 μ crassae.

Ad folia viva *Polygoni avicularis* L., Juli, 1833. Sporis brevioribus, fuscidulis, hyphisque brevioribus, etc., a *Cercospora polygonacea* E. et E. bene distincta; cum *Cercospora Polygonorum* Cke. non comparanda.

CREPIDOTUS RUFO-LATERITIUS Bresadola in litt. ad me.—Pileus membranaceus, resupinatus, raro reflexus, cupularis, 2—4 millim. latus, glaber, lateritio-rufidulus, margine lobato. Lamellae latae, ventricosae, valde distantes, in puncto excentrico concurrentes, utrinque rotundatae, concolores acie alba. Sporae ovatae, flavidae, 10—12 μ longae, 8 μ crassae.

Ad corticem *Crataegi crus-galli* L., Februar, 1884.

ÆCIDIUM CERASTII Winter nova species.—Pseudoperidia supra faciem foliorum inferiorem totam dense sparsa, interdum praecipue secus nervum primarium stipata, sine macula, sed folium totum decolorantia, semiimmersa, patellaeformia, late aperta, margine crenulato incisoque, late recurvo, albida. Sporae angulato-rotundatae, tenuissime verruculosae, aurantiaceae, 17—22 μ diam.

Ad folia viva *Cerastii nutantis*, Reff. Mai. 1885.

NORTH AMERICAN SPECIES OF CYLINDROSPORIUM.

BY J. B. ELLIS AND B. M. EVERHART.

CYLINDROSPORIUM, Unger, Em.* *Cylindrospora*, Ung. Exanth, p. 166.—Of this genus, as now understood, Saccardo, in Syll. III, describes eighteen species and defines the genus as follows:

“Acervula (collections of hyphae and conidia) subepidermidal, white or pallid, disciform or subeffuse. Conidia filiform, hyaline, continuous, generally flexuous.” This character, so far as the conidia are concerned, should be emended for the conidia, at first generally nucleate, become in some cases certainly, possibly in all, one or more septate. The subepidermal origin of the conidia is the essential character separating this genus from *Cercospora*. In *Glœosporium* the spores are shorter and thicker and are mixed with a viscous fluid which, expelled with them, dries into little resin-like heaps on the surface of the matrix. The following species of *Cylindrosporium* have thus far been found in this country:

1. CYLINDROSPORIUM VERATRINUM, Sacc. & Winter, Rab-Winter's Fungi Eur. 2879, Sacc. Syll. III, p. 740.

Acervuli minute, innate, seriate, irregular. Hyphae filiform. Conidia bacillary, curved, rounded at the ends, 75—90 x 3½—4½ μ , 2—3-septate, not constricted, hyaline, expelled in white tufts or heaps which form narrow,

* The *Cylindrosporium* of Preuss in Linn. 1851, is, as we judge from the figure of *C. longipes*, in Sturm's Flora III, 29, p. 69 tab. 35, synonymous in part, at least, with *Chalara*.

white lines or striæ, $\frac{1}{2}$ —1 cm. long, on each side of which the leaf is slightly discolored.

On living leaves of *Veratrum viride*, Adirondac Mts., N. Y. (Peck).

2. CYLINDROSPORIUM SCROPHULARIÆ, S. & E., Mich. II, p. 575.

Spots minute, white with a broad, discolored margin. Acervuli small, subepidermal. Conidia filiform, curved, $30-40 \times 1\frac{1}{2}-2 \mu$, 3-nucleolate, becoming 1—3-septate, hyaline arising from a slender, vaguely branched mycelium.

On leaves of *Scrophularia nodosa*, Pennsylvania (Martin), Illinois, (Hart.) *Septoria Scrophularia*, West, occurs on the same spots and has spores much like those of the *Cylindrosporium* only narrower (1μ), and usually more or less bent.

3. CYLINDROSPORIUM MICROSPILUM, Sacc. & Winter, *Miscellanea Mycologica*, p. 16.

Spots circular, very small, white with a narrow, dark margin. Acervuli innate, amphigenous, punctiform, pale. Conidia bacillary, somewhat curved, rounded at each end, $50-60 \times 4 \mu$, spuriously 4—6-septate, hyaline.

On oak leaves, Missouri (Demetrio).

4. CYLINDROSPORIUM GLYCYRRHIZÆ, Hark., Bull. Cal. Acad., Feb. 1884, p. 32.

Hypophyllous, covering nearly the whole surface of the affected leaflets, oozing out in tendrils. Conidia cylindrical, attenuated at each end, with several vacuoles, $40-70 \times 4-5 \mu$.

On living leaves of *Glycyrrhiza lepidota*, Sunol, Cal. (Harkness.)

5. CYLINDROSPORIUM GEI, Farlow. *Appalachia*, vol. III, p. 250.

Spots small, distinctly limited. Hyphæ hyaline, amphigenous, very numerous from a dense, subparenchymatous mass of threads, making their way through the stomata, forcing apart the closing cells, slender, about $75-115 \mu$ long, scarcely 3μ in diameter, simple or branching, ending in very long ($80-110 \mu$) filiform, hyaline conidia, which are straight or irregularly bent.

On leaves of *Geum radiatum*, var. Peckii, White Mts., N. H. (Farlow).

6. CYLINDROSPORIUM RUBI, Ell. & Morgan, n. s.

Spots amphigenous, brownish-gray and definite above ($2-3 \text{ mm.}$), sometimes confluent, nearly concealed below by the tomentum of the leaf. Acervuli epiphyllous, punctiform, subcutaneous, then suberumpent, pale. Spores filiform, narrower at one end, nearly straight or more or less curved, 3—5 (mostly 3-) septate, hyaline, $40-55 \times 2\frac{1}{2} \mu$ at the thickest part. Hyphæ rudimentary and obscure.

On living leaves of *Rubus strigosus* (cult.), Wis. (Dr. J. Brown.)

7. CYLINDROSPORIUM CIRCINANS, Winter, n. s.

Acervuli epiphyllous, large, applanate, generally circinately or concentrically crowded, more rarely irregularly gregarious, rotundate-angular or irregular, often confluent, forming brownish or dirty gray circles

or spots, sometimes as much as 15 mm. in diameter, with an elevated, rather obscure, flexuous border. Spores cylindric-fusiform, rather acute at each end, sparingly septate, hyaline, often flexuous, $20-30 \times 1\frac{1}{2} \mu$.

On living leaves of *Sanguinaria Canadensis*, Perryville, Mo., May, 1884 (C. H. Demetrio).

8. *CYLINDROSPORIUM FRAXINI* (E & K.), Journ. Myc. I, p. 2, sub *Cercospora*.

Further observation shows that the origin of the conidia in this species is subepidermal and that it is really a *Cylindrosporium*, as that genus is now understood. It was described as follows:

Scattered over the lower surface of the leaf on small, rusty brown spots, limited by the veinlets of the leaf and forming at length, by confluence, much larger ($\frac{1}{2}$ —1 cm.) patches with an irregular outline. The leaf is also mottled above with rusty brown in which small, light colored spots mark the position of the denser tufts beneath. Hyphæ densely tufted, nearly hyaline, short, ($16-26 \mu$) lax, slightly swollen at the base, bearing the cylindrical, nearly hyaline (with a slight yellowish tinge) 3—4 septate, granular and nucleate conidia, $70-100 \times 5-6 \mu$, more or less curved and ends obtuse. Accompanied by an immature *Sphaerella* of which it is probably the conidial stage.

On *Fraxinus viridis*, Kansas (Kellerman).

Possibly *Cercospora Toxicodendri*, Ell., may also be referred to *Cylindrosporium*.

HOST PLANTS.

Fraxinus viridis (C. Fraxini, E. & K.) 8.

Geum radiatum (C. Gei, Farlow) 5.

Glycyrrhiza lepidota (C. Glycyrrhizæ, Hk.) 4.

Oak leaves (C. microspilum, S. & W.) 3.

Rubus occidentalis (C. Rubi, Ell. & Morg.) 6.

Sanguinaria Canadensis (C. circinans, Winter) 7.

Scrophularia nodosa (C. Scrophulariæ, S. & E.) 2.

Veratrum viride (C. veratrinum, S. & W.) 1.

A NEW GENUS OF PYRENOMYCETES.

BY J. B. ELLIS AND B. M. EVERHART.

Among the published species of *Sphaeronema*, we find two that are ascigerous, and for their reception the following new genus is proposed.

HYPSOTHECA, Ell. & Everhart.—Perithecia (stroma?) subulate, stylosporiferous at base and with a medial or subapical enlargement above containing the ascigerous nucleus. This latter character will distinguish the proposed genus from *Ceratostoma*. *Caliciopsis*, Pk., is also closely allied but is placed by its author among the *Discomycetes*.

HYPOTHECA SUBCORTICALIS, (C. & E.) *Sphaeronema subcorticale*, C. & E., Grev. VI, p. 83.—Perithecia subcylindrical, about $1\frac{1}{2}$ mm. high and $100\ \mu$ thick, only slightly enlarged at base and containing a few subglobose, continuous, brown stylo-pores. $3-5\ \mu$ diameter, or oblong-ovate. $6-10 \times 4-5\ \mu$ and $2-3$ -septate. Ascigerous cavity subapical, formed by a gradual subovate enlargement $150-175\ \mu$ diameter in the middle and closely packed with the oblong-ovate or subelliptical, 8-spored asci, $12-15 \times 7-9\ \mu$ on slender pedicels $15-25\ \mu$ long, and without paraphyses. The asci are hyaline and smaller at first. Sporidia conglomerated, subglobose, brownish, $3-3\frac{1}{2}\ \mu$.

Growing from the inner surface of the loosened bark or from the exposed edges of loosened pieces of bark on dry, decaying oak limbs, lying on the ground. Newfield, N. J., Sept., 1877, and March, 1883.

This description was made from re-examination of the original specimens.

HYPOTHECA CALICIOIDES, (Fr.) *Sporocybe calicioides*, Fr. S. M. III. p. 342. Exsiccati, Rav. Fung. Car. I, No. 83.—Gregarious, subulate, black and smooth, about $1\frac{1}{2}$ mm. high, $115\ \mu$ thick, the swollen, subelliptical, ascigerous cavity, about midway between the base and apex. $250\ \mu$ thick. Asci (spore bearing part) oblong or obovate, $15-20 \times 8-11\ \mu$, with a thread-like stipe of about the same length. Sporidia conglomerated, elliptical, hyaline becoming brown, continuous, $6-7 \times 3-3\frac{1}{2}\ \mu$. Ravenel's specimens are on poplar bark. Mr. C. J. Sprague has sent specimens collected by W. N. Suksdorf in Washington Territory, and which agree in all respects with Ravenel's specimens. Suksdorf's specimens are also, apparently, on bark of poplar.

To the two above described we add the following new species which has, as yet, been found but sparingly.

HYPOTHECA THUJINA, E. & E.—On partly dead foliage of *Cupressus thyoides*, Newfield, N. J., April, 1880. Perithecia subulate, $700-800\ \mu$ high and $55-60\ \mu$ thick below, with a gradually enlarged or swollen place near the top, about $150\ \mu$ long and $90-100\ \mu$ thick and above this, again contracted to about the same size as below, forming a truncate beak $75-80\ \mu$ long, the whole being, in fact, a hollow cylinder of fibrose-cellular structure, slightly enlarged at base and filled with minute, hyaline, oblong or cylindrical, straight or slightly curved, $2-3 \times \frac{1}{2}\ \mu$ spermatia and the swollen part above filled with an abundance of club-shaped, 8-spored asci, without paraphyses, and consisting of an obovate or subelliptical head or spore-bearing part $9-11 \times 4\frac{1}{2}-5\frac{1}{2}\ \mu$ and a filiform base or stipe $15-20\ \mu$ long. The membrane of the asci is very delicate and scarcely discernible after the sporidia have matured but easily seen in the young state. Sporidia globose, pale-brown, $2\frac{1}{2}\ \mu$ in diameter, collected in a mass.

A NEW STEREUM FROM NORTH CAROLINA.

STEREUM (MERISMA) CAROLINIENSE, Cke. & Rav. •

Pileus multiplex, infundibuliform, deeply incised, forming lobes variable in size, all confluent at the base in a common stem. Whole plant six inches high, 4—5 inches broad, ochraceous, with faint zones of darker color, margin of lobes entire, surface smooth. Hymenium even, ochraceous-white; stem minutely velvety.

Wilmington, North Carolina (Dr. Thomas F. Wood.)

Allied to *S. multizonatum*, Berk, which is a *Stereum* rather than a *Thelephora*. C.

Found also, quite recently, at West Chester, Pa., by Mr. Everhart. This species differs from the usual type of *Stereum* in its subcarnose texture, being quite soft and juicy when fresh, and decaying quickly unless dried with care. The general aspect is that of a large, pallid *Thelephora*.—[EDS.]

NEW LITERATURE.

BY W. A. KELLERMAN.

“THE GENUS CINCRACTIA.” By William Trelease, in the Bulletin of the Torrey Botanical Club, July, 1895, with plate.

This article of two pages refers particularly to a rare smut on species of *Cyperus* and *Fimbristylis* named by Berkely in 1852 *Ustilago axicola*, now referred to a new genus (*Cintractia*) by Cornu because its mode of fruiting is so different from that of other species of *Ustilago*—and *Ustilago Junci*, Schw., on *Juncus tenuis*, hitherto found from New York to North Carolina, and west to Wisconsin and Iowa. The mycelium of the latter, “as in the preceding species, persists within the diseased parts of the host, though it is usually less abundant in the pith. Outside of the fibro-vascular bundles it becomes denser, forming a continuous, gelatinous stroma, which is colorless except for a narrow, yellowish band near its outer edge. The outermost cells of this stroma are uniformly fertile, so that its entire outer portion passes into a mass of young spores that are gradually pushed outward as they mature. At first the sori are covered by the epidermis which renders them lead-colored. After its disappearance the mass of spores appears intensely black, and gradually crumbles away. The mature spores, as seen singly, are of a dark brown color and rather opaque. They are minutely granulated, irregularly rounded or ellipsoidal in form, and measure 12—15 x 14—21 μ .” Its name therefore would be *Cintractia Junci* (Schw.)

“PARASITIC FUNGI OF ILLINOIS,” Part I. By T. J. Burrill, Bulletin of the Illinois State Laboratory of Natural History. Vol. II.

This consists of an Introduction, 10 pages; an account of Uredineæ.

3 pages; a key to the genera, 2 pages; descriptions of the species with host plants, dates and localities, 85 pages; a Glossary, 3 pages; and Indexes to Host Plants and to the Species, 7 pages. The genera and number of species given are as follows: *Uromyces* 20, *Puccinia* 48, *Phragmidium* 5, *Ravenelia* 1, *Gymnosporangium* 1, *Cronartium* 1, *Melampsora* 4, *Coleosporium* 2, *Uredo* 1, *Cæoma* 2, *Æcidium* 42, and *Ræstelia* 2. Prof. Burrill describes the following species: *Uromyces* *Ænotheræ*, Burr., on *Æ. linifolia*; *U. Scirpi*, Burr., on *S. fluviatilis*; *U. graminicola*, Burr., on *Panicum virgatum* and *Elymus Virginicus*; *Puccinia tenuis*, Burr., on *Eupatorium ageratoïdes*; *P. Seymeriæ*, Burr., on *S. macrophylla*; *Melampsora Crotonis*, Burr., on *C. capitatum*, *C. mononthogynus* and *C. linearis*; *Æcidium Diodiæ*, Burr., on *D. teres*; *Æ. Myosotidis*, Burr., on *M. verna*; *Æ. Crotonopsidis*, Burr., on *C. linearis*; and *Æ. Trillii*, Burr., on *T. recurvatum*.

"THE MYCOLOGIC FLORA OF THE MIAMI VALLEY, Ohio." By A. P. Morgan. The Journal of the Cincinnati Society of Natural History, Vol. VIII, p. 91, continued from Vol. VII, p. 10.

This article of twenty pages contains the descriptions of the species of *Polyporus*, giving, as in the three preceding articles, a synoptical key by means of which the labor of identification is somewhat facilitated. There is one accompanying plate, of *P. delectans*, Peck. Prof. Morgan in these papers is doing good service in a most difficult field for which amateurs and beginners particularly will be very thankful. The preceding pamphlet of Prof. Burrill's belongs also to the same category.

"BEITRÄGE ZUR FLORA DER ROST UND BRANDPILZE (UREDINEEN USTILAGINEEN) TIJUEKENS." Von G. Oertel. (Fortsetzung von Nr. 4, 5, p. 73.) Deutsche botanische Monatschrift, III Jarh. Nr. 7—8.

"NEW BRITISH FUNGI." By M. C. Cooke. Grevillea, Sept. 1885.

"CALIFORNIAN FUNGI." By M. C. Cooke and W. H. Harkness, l. c.

"SOME EXOTIC FUNGI." By M. C. Cooke, l. c.

Eight described species from Australasia, seven from Southern Asia, one from South Africa, and four from North America. The latter are *Radulum concentricum*, Cke. & Ellis, on logs, Oregon; *Cytispora Smilacis*, Cke., on exposed roots of *Smilax*, Darien, Georgia; *Hysterium (Gloniella) syconophilum*, Cke., on living bark of *Ficus carica*. S. C.; and *Ailographum Arundinariæ*, Cke., on culms of *Arundinaria*, Darien, Georgia.

"THE MYXOMYCETES,—Their collection and preservation." By Geo. A. Rex. The Botanical Gazette, 1885, p. 290.

ERRATA.

On page 112, *Glœosporium punctiforme*, Sacc. & Ell. (No. 14) is, by some inexplicable oversight, only No. 29 duplicated under another specific name, and must therefore be cancelled.

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No. 11.

SYNOPSIS OF THE NORTH AMERICAN SPECIES OF *ASTERINA*, *DIMEROSPORIUM* AND *MELIOLA*.

BY GEORGE MARTIN.

ASTERINA.

ASTERINA, Liv. Ann. Science Nat. 1845, 3, p. 59. (Etym. *Aster* from the radiating mycelium.) Perithecia globose, depressed or lenticular, membranous, subastomous, seated upon spots of black radiating subsuperficial (rarely subinnate) mycelium. Asci properly short and thick mostly 8-spored; sporidia two-celled, pleuriseptate or continuous, hyaline or brown. Sylloge Fungorum I, p. 39.

The perithecia in the species we now find included in this genus vary from an entire membranous sac to a mere covering of coalesced radiating hyphæ, and the mycelium, which typically forms black spots, is often light colored, scant, evanescent or entirely obsolete. The genus therefore contains some species nearly approaching *Sphærella* and *Microthyrium* on the one hand and *Ascomycetella* on the other.

The following classification has been adopted :

- A. Perithecia complete, depressed or lenticular.
- B. Perithecia incomplete, flattened or scutellate.
- C. Species imperfect or doubtful.

Species with globose perithecia will be included in *Dimerosporium*.

The quotation marks indicate that the species so enclosed are only known to me through the published descriptions.

It is proper that I should here state that I am under great obligation to my friend, J. B. Ellis, for furnishing me with specimens not in my herbarium, and for his criticism of many of my notes.

- A. Perithecia complete, depressed or lenticular.

1. *ASTERINA ANOMOLA*, Cke. & Hark., Grev. 9, p. 67.

"Effused black, velvety; perithecia hemispherical or globose depressed; mycelium intricate, brown with erect, rigid, scattered setæ; asci clavate; sporidia biseriate, lanceolate, 1—5-septate, hyaline, 20—24 x 4 μ . Perithecia 80 μ in diameter, setæ about twice as long and sometimes found upon the former." Probably a *Dimerosporium*.

On living laurel leaves, California.

2. *ASTERINA CARNEA*, Ellis & Martin. Am. Nat. 17, p. 1284. Ellis N. A. F. No. 1290.

Mycelium thin, brown, hypophyllous, adnate, mostly near the margin of the leaf or in orbicular spots, about 5 mm. in diameter; perithecia flesh colored, flattened, soft, crowded, 60—100 μ in diameter; asci obovate, sessile, 8-spored, 30—40 x 22—35 μ ; sporidia subhyaline, ovate, two-celled, uniseptate, 16—17 x 7—8 μ .

On *Persea palustris*, Florida.

3. *ASTERINA CELASTRI*, Ellis & Kellerman. Journ. of Mycology I, p. 3.

Perithecia hypophyllous in groups or scattered, convex, orbicular, black, 250 μ in diameter; mycelium of brown radiating threads around the base; asci oblong, ovate, 12—15 x 6—7 μ , filled with granular matter; immature. The parts of the leaf occupied by the groups of perithecia are a little darker than the surrounding portions.

On living leaves of *Celastrus scandens*, Kansas.

4. *ASTERINA DELITESCENS*, E. & M. Am. Nat. 17, p. 1284. Ellis N. A. F. No. 1291.

Mycelium thin, black, orbicular, epiphyllous, 2—4 mm. in diameter, perithecia black, flattened, crowded, 75 x 100 μ , structure radiate-cellular; asci oboval or subglobose, 8-spored, 30—35 x 18—24 μ ; sporidia subhyaline, oval, uniseptate, 15—18 x 6—7 μ .

On living leaves of *Persea palustris*, Florida.

5. *ASTERINA GAULTHERIÆ*, Curtis. Ellis N. A. F. No. 1358.

Perithecia brown-black, flattened, slightly elevated in the center, hypophyllous, scattered, 170—250 μ in diameter, surrounded by a narrow border of brown, branching mycelium; asci ovate, 22—25 x 13—16 μ ; sporidia hyaline, obovate, uniseptate, the upper cell the larger, 9 x 3 μ .

On living leaves of *Gaultheria procumbens*, Newton, Mass.

6. *ASTERINA NUDA*, Pk.

Mycelium brown, branching, scanty; perithecia black, at first subglobose, afterwards depressed, thickly clustered near the midrib, mostly hypophyllous, 100—150 μ in diameter, structure cellular; asci oval, 8-spored, 35—40 x 10 μ ; sporidia ovate, hyaline, uniseptate, biseriate, 10—12 x 3—4 μ .

On living leaves of *Abies* (?)

I do not know where Prof. Peck published this species, but the above description is from an authentic specimen gathered by him.

7. *ASTERINA PEARSONI*, E. & E. Jour. of Mycology, I, p. 92.

"Perithecia minute (100 μ), flat, superficial, obscurely perforated above, of close cellular structure, with a scanty, subradiating mycelium around the margin; asci oblong, obtuse, sessile, 40 x 15 μ , without paraphyses; sporidia biserial, clavate, oblong, granular, becoming uniseptate and slightly constricted at the septa, 15—20 x 3½—4½ μ , acute below, obtuse above, hyaline."

On blackberry canes, Vineland, N. J.

8. *ASTERINA PINASTRI*, Sacc. & Ellis. *Michelia* 2, p. 567. Ellis N. A. F. No. 789.

Perithecia black, globose-depressed, gregarious, astomous, 100—120 μ . Structure cellular; mycelium brown, branching, closely septate, very scant; asci oblong, ends obtuse, sessile, 8-spored, 40—50 x 20—24 μ , without paraphyses; sporidia 2—3 serial, oval, uniseptate, hyaline at first, then dusky, 18—20 x 6—7 μ .

On leaves of *Pinus rigida*, New Jersey.

9. *ASTERINA TENELLA*, Cke. Grev. 13, p. 67.

"Epiphyllous, effused, thin, black; perithecia minute (.03—.22 mm.) applanate, mingled with brown, creeping, mycelium; asci saccate, 4—8-spored; sporidia (eight-spored) 28—30 x 12—14 μ , (four-spored) 40 x 22 μ , light brown."

On *Persea Carolinensis*, Carolina.

10. *ASTERINA XEROPHYLLI*, Ellis. Am. Nat. 17, p. 319.

"Mycelium scanty; perithecia entirely superficial, orbicular or subelongated, slightly depressed, 167 μ in diameter; asci obovate contracted into a thick, stipe-like base, 35 x 15 μ ; sporidia hyaline, fusiform or clavate-fusiform, faintly 3-septate, 18—20 x 3—3½ μ .

On fading leaves of *Xerophyllum asphodeloides*, New Jersey.

B. Perithecia incomplete, flattened or scutellate.

11. *ASTERINA DISCOIDEA*, E. & M. Am. Nat. 18, p. 1148. Jour. of Mycology, 1, p. 101.

Perithecia hypophyllous, orbicular, slightly depressed in the center, olivaceous, thin, 500—800 μ in diameter with an indistinct, reticulated margin; asci obovate or globose, 30—40 x 30—35 μ ; sporidia crowded, clavate-oblong, uniseptate, 12—16 x 4—5 μ . Closely allied to *Ascomycetella*.

On living leaves of *Quercus laurifolia*, and of *Olea Americana*, Florida.

12. *ASTERINA ILICIS*, Ellis. Am. Nat. 17, p. 319. Ellis N. A. F. No. 1357.

Perithecia brown black, hypophyllous, scattered, adnate, at first hemispherical then flattened and depressed, 100—120 μ in diameter, opening circular, structure a disc of brown, interlacing hyphæ covering the nucleus and forming a narrow margin beyond; asci obovate, 8-spored, 22—30 x 9—15 μ ; sporidia subhyaline, oblong, 1-septate, biserial, 11 x 4 μ .

On living leaves of *Ilex glabra*, Newfield, N. J.

13. *ASTERINA INTRICATA*, E. & M. n. sp.

Mycelium white, scanty, evanescent; perithecia brown, flat-orbicular, soft, very thin, hypophyllous, 500 μ in diameter, asci subglobose, stipitate, 15—18 x 18 μ ; sporidia hyaline, obovate or ovate, 1-septate, 7—12 x 2—3 μ . Closely allied to *Ascomycetella*.

On living leaves of *Quercus arenaria*, Florida.

14. *ASTERINA LEPIDIGENA*, E. & M. Am. Nat. 18, p. 1148. Ellis N. A. F. No. 1361.

Mycelium hyaline, scanty, hypophyllous; perithecia black, subglobose, at length flat, very thin and fragile, 200—300 μ in diameter; asci ovate, 8-spored, 30 x 15 or 42 x 12 μ ; sporidia obovate, hyaline, 1-septate, 12 x 4 μ .

Attached to the epidermal scales on old, living leaves of *Andromeda ferruginea*, Florida. Closely allied to *Ascomycetella*.

15. *ASTERINA PATELLOIDES*, E. & M. *A. erysiphoides*, E. & M. Ellis N. A. F. No. 1359.

Perithecia dark brown, soft, orbicular, flattened, depressed in the center, hypophyllous, 275—300 μ , with a narrow border of scanty, radiating, white, mycelium; asci ovate, oblong, 8-spored, 36 x 15 μ ; sporidia obovate, 1-septate, 2-seriate, hyaline, 15—6 μ . Closely allied to *Ascomycetella*.

On living leaves of *Quercus laurifolia*, Florida.

The name of this species has been changed, as *A. erysiphoides* had previously been given to another plant.

16. *ASTERINA PUSTULATA*, E. & M. Am. Nat. 18, p. 1148.

Perithecia brown, soft, flattened, hypophyllous, adnate, 200—500 μ in diameter, structure a membranous disc of brown, branching, coalesced hyphæ, covering the nucleus and forming a narrow border beyond; asci subglobose, 8-spored, 50—60 μ in diameter; sporidia hyaline, obovate, 1-septate, 30—40 x 10—12 μ . Closely allied to *Ascomycetella*.

On living leaves of *Quercus laurifolia*, Florida.

17. *ASTERINA STOMATOPHORA*, E. & M. Journal of Mycology, I, p. 98.

Perithecia brown black, lenticular, stomatous, hypophyllous, scattered, 170—180 μ in diameter, texture cellular, forming a disc which covers the nucleus and extends beyond in a thin reticulated margin; asci oblong, broader above and abruptly contracted into a short stipe, 30—35 x 6—8 μ ; paraphyses none; sporidia oblong-obovate, hyaline, 1-septate, 2-seriate, 7—12 x 2½—3 μ .

On living leaves of *Quercus laurifolia* and of *Gelsemium sempervirens*, Florida.

18. *ASTERINA SUBCYANEA*, E. & M. Am. Nat. 18, p. 1148. Ellis N. A. F. No. 1360.

Perithecia hypophyllous, convex, depressed, ostiolate, obsolete beneath, 250—300 μ in diameter, structure moniliform hyphæ of subglobose, dark greenish blue cells, 5—7 μ in diameter, which cover the

nucleus and extend beyond in a thin, membranous border, closely adnate to the leaf, ostiolum papilliform, collapsing with a broad, circular opening when dry; asci slightly narrower at each end, sessile, 8-spored, $75 \times 15 \mu$; sporidia hyaline, oblong-clavate, 1-septate, 2-seriate, $20 \times 4-7 \mu$.

On living leaves of *Quercus laurifolia*, Florida.

C. Species imperfect or doubtful.

19. ASTERINA CONGLOBATA, B. & C. Grev. 4, p. 9.

"Mycelium a few slender threads; perithecia globose, minute, conglobate; asci obovate; sporidia shortly subfusiform, 1-septate." Probably a *Dimerosporium*.

On *Arbutus Uva-ursi*.

20. ASTERINA COMATA, B. & Rav. Grev. 4, p. 9. Ravenel F. A. No. 73.

Scattered, large, densely clothed with short, brown hairs, about 700μ in diameter; mycelium obsolete. No fruit, immature.

On leaves of *Magnolia glauca*, and *M. grandiflora*, Alabama to Florida.

21. ASTERINA CUTICULOSA, Cke. Grev. 7, p. 49. Ravenel F. A. No. 328.

Perithecia brown, orbicular, applanate, adnate, hypophyllous, clustered near the margin of the leaf, $500-800 \mu$ in diameter, structure cellular membranaceous, obsolete beneath; no mycelium; "asci globose, 25μ in diameter; sporidia elliptic, ends obtuse, 1-septate, subconstricted, hyaline, $10 \times 5 \mu$. A somewhat abnormal species," (Cke.)

On leaves of *Ilex opaca*, Georgia.

My specimen is sterile.

22. ASTERINA DECOLORANS, B. & C. Grev. 4, p. 9.

"Spots orbicular, red, undulate, bullate; mycelium scanty, consisting of a few moniliform threads and others entire; perithecia punctiform; asci short, oblong; sporidia, 1-septate, 10μ long."

On an unknown leaf, New Jersey.

23. ASTERINA DIPLODIOIDES, B. & C. Grev. 4, p. 9.

"Spots orbicular, mycelium interrupted; perithecia minute; sporidia oblong, obtuse, uniseptate, light brown, 8μ long."

On leaves of *Andromeda acuminata*, Alabama.

24. ASTERINA NIGERRIMA, Ellis. Bulletin Torr. Bot. Club, 8, p. 91.

Mycelium brown, branching, scanty; conidia oval, dusky, $4\frac{1}{2}-6 \times 3 \mu$, in subglobose sacs, 60μ in diameter. Perithecia black, orbicular, flattened, stomatous, subinnate, $95-140 \mu$ in diameter, structure cellular-radiate, obsolete beneath, asci oblong-clavate, sessile, $33-36 \times 10-14 \mu$; sporidia hyaline, obovate, 1-septate, ("4-nucleate," Ellis) $10-12 \times 3-4 \mu$.

On old stems of *Erigeron*, Newfield, N. J.

This is probably a *Microthyrium*.

25. ASTERINA OLEINA, Cke. Grev. 11, p. 38. Ravenel F. A. No. 757.

Perithecia hypophyllous, scattered, flattened, discoid with a narrow margin of brown radiating hyphæ; asci clavate, $24-30 \times 9-10 \mu$ sporidia undeveloped in my specimen. "Sporidia hyaline, small, uniseptate

(immature). Pycnidia similar but smaller, stylospores minute, oval, hyaline $5\ \mu$ long." Cke.

On leaves of *Olea Americana*.

26. *ASTERINA PELLICULOSA*, Berk. Sylloge 1, p. 46.

"Mycelium pelliculose, in spots, black; perithecia globose-depressed, black; asci obovate; sporidia oblong-ellipsoid, 1-septate $16-20\ \mu$ long. Probably a *Dimerosporium*.

On leaves of *Prinos*, etc., etc. Ceylon, Cuba, N. America, etc."

Asterina pelliculosa in Ravenel's F. A. No. 75, appears to be identical with *Dimerosporium* (*Asterina*) *orbiculare* B. & C., and cannot be the same as that described above.

27. *ASTERINA PLANTAGINIS*, Ellis. Bull. Torr. Bot. Club, 9, p. 74. Ellis N. A. F. No. 790.

Spots brownish, immarginate; perithecia brown-black, subglobose, membranaceous, innate, clustered in the spots, mostly epiphyllous, $70-80\ \mu$ in diameter, "with a few brown threads radiating from the base or entirely wanting," (Ellis.) Asci ovate, $26-33 \times 13-16\ \mu$; sporidia hyaline oblong, obtuse, 1-septate, slightly constricted at the middle or 2-nucleate, $9-10 \times 3-5\ \mu$.

On living leaves of *Plantago major*, Philadelphia, Pa.

This is probably a *Sphaerella*.

28. *ASTERINA RAMULARIS*, Ellis. Bull. Torr. Bot. Club, 9, p. 20. Ellis N. A. F. No. 720.

Mycelium light, subhyaline, very scanty; perithecia flattened, orbicular, stomatous, clustered, frequently coalescing, subinnate, $250-300\ \mu$ in diameter, structure dark brown moniliform hyphæ covering the nucleus, obsolete beneath, mostly sterile; "Asci oblong, spore bearing portion $50 \times 25\ \mu$, stipe at length absorbed; sporidia light, crowded, elliptical, coarsely granular with 1-2 large vacuoles at first, about $15 \times 10\ \mu$ " (Ellis.)

On dead twigs of *Lindera Benzoin*.

Probably a *Microthyrium*.

29. *ASTERINA SPUREA*, B. & C. Grev. 4, p. 10.

"Perithecia scattered, dot-like, surrounded by short, articulated, submoniliform, radiating threads, which are joined together laterally in twos, sometimes forked at the apex."

On leaves and stems of *Hyptis radiata*. Carolina and Alabama.

30. *ASTERINA WRIGHTII*, B. & C. Grev. 4, p. 10.

"Mycelium very thin; perithecia brown, granular, crowded, like little grains of gunpowder, surrounded by cirrhat threads; asci clavate, short." Texas, C. Wright.

"Apparently on some smooth *Curcubit*."

31. *ASTERINA CUPRESSINA* (Rehm) Cke. Grev. 6, p. 17. Ellis N. A. F. No. 500.

Perithecia dark brown. hemispherical or lenticular, adnate, stomatous, 85—290 μ in diameter; structure coalesced, brown, radiating hyphæ. covering the nucleus and forming a narrow border beyond, obsolete beneath; asci cylindrico-clavate, stipitate, 8-spored, 50 x 15 μ ; sporidia brown, obovate, 1-septate, 2-seriate, 12—15 x 6—7 μ . "Three to six rigid hairs are sometimes attached to the perithecia," and the larger ones contain pycnidia with brown, elliptic stylospores, 20 x 10 μ ," Cke.

On dead leaves of *Cupressus thyoides*. Rhem Ascomycetum, Venturia Cupressina, No. 394.

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NEW FUNGI.

BY J. B. ELLIS AND B. M. EVERHART.

NECTRIA (CALONECTRIA) FULVIDA, E. & E.—On bark of decaying oak limb lying on the ground, Newfield, N. J., Oct. 7, 1885. Perithecia superficial, gregarious, subglobose, small (1-6 mm.), tuberculose-squamulose, light yellow, collapsing above when dry. Ostiolum large but not prominent. Asci oblong-cylindrical, nearly sessile, obtuse, about $75 \times 10-12 \mu$, surrounded by indistinct paraphyses. Sporidia 8 in an ascus, fusiform, hyaline or nearly so, slightly curved, $38-50 \times 3-3\frac{1}{2} \mu$, tapering from the middle to each end, nucleate, becoming about 8-septate. The specimens were growing on the bark of an old swelling caused by *Dichena strumosa*, Fr.

NECTRIA ATROFUSCA (Schw.), Syn. N. Am. No. 1429.—On dead limbs of *Staphylea trifolia*, West Chester, Pa., Oct., 1885 (Everhart.) Densely crowded on a tuberculiform stroma 1-1½ mm. broad, and easily separable from the bark into which its base is sunk. Perithecia (20-40) minute (1-6 mm.), depressed, conic, black, rough except the subconic, somewhat polished ostiolum which is at length radiate-sulcate cleft. Asci about $75 \times 16 \mu$, oblong-cylindrical; sporidia hyaline or nearly so, oblong-elliptical, or sometimes a little narrower at one end, 1-septate, very slightly constricted, $10-12 \times 4\frac{1}{2}-5 \mu$, ends obtuse. In some cases the perithecia were found growing around the margin or on the bare wood in the bottom of the little pits from which the stroma had fallen. The mature sporidia have a smoky yellow tint. This appears not to have been met with before since Schweinitz's time.

HYPOCREA CORTICI^{icola}OIDES, E. & E.—On bark of dead limbs of *Magnolia glauca*, Newfield, N. J., Aug. 1885. Stroma thin, milk white with the margin slightly cottony, forming a continuous layer extending along the limb for six inches or more, finally becoming dirty white and crack into small areas as in *Corticium polygonum*, Pers. Perithecia globose, pale, 75μ in diameter, bedded in the stroma and visible under the lens as horn-colored specks. Asci clavate-cylindrical, $20-22 \times 3\frac{1}{2} \mu$, sessile. Sporidia partly biserial, 8 in an ascus, each consisting of two globose, hyaline cells about 1μ in diameter and easily separating. The stroma (?) appears to be a true *Corticium* with clavate-cylindrical basidia bearing subglobose, 3μ spores. If we adopt this view the ascigerous perithecia are parasitic on the *Corticium* and might be referred to *Hypomyces* but for the sporidia which are those of *Hypocrea*. It is certainly a very peculiar fungus.

DIATRYPE MEGASTOMA, E. & E.—On dead trunks of *Alnus serrulata*, Newfield, N. J., July, 1885. Stroma cortical, orbicular, 2—3 mm. in diameter, limited by a black line which penetrates the wood beneath to the depth of about 1 mm., often confluent or subconfluent in series of 5—10 cm., bursting through the bark with a longitudinal cleft. Perithecia 15—25 in a stroma, orbicular or ovate, with thick, black, membranaceous walls, contracted above into a narrow neck. Ostiola large, prominent, and 4—5-stellate-cleft. Asci slender, clavate, 75—80 x 6—7 μ (spore-bearing part 35—40 μ long). Paraphyses very abundant and distinct at first, much exceeding the asci but finally disappearing. Sporidia cylindrical, yellowish, strongly curved, generally with a nucleus in each end, subbiserial above, 5—6 x 2 μ . This is allied to *D. microspora*, Ell., and *D. moroides*, C. & P. From the former it may be distinguished by its smaller and less prominent stroma, and its longer asci and longer, lighter colored, strongly curved sporidia, and from the latter by its stroma limited by a black line, its more prominent and larger ostiola, and its strongly curved, much lighter colored, shorter sporidia. It may be distinguished by these last two characters also from *D. phæosperma*, Ell.

D. megastoma is accompanied by a *Libertella* with filiform, curved spores 20—25 x 1 μ —apparently its spermogonial stage.

(TO BE CONTINUED.)

NEW LITERATURE.

BY W. A. KELLERMAN.

“PLANTS OF THE GREELEY EXPEDITION.” By Geo. Vasey. The Botanical Gazette, Sept. and Oct., 1885.

A list of plants collected in the vicinity of Fort Conger, Grinnell Land, and read before the Botanical Club of the A. A. A. S., consisting of sixty-one flowering plants, two equiseta, one fern and one fungus. The latter, hitherto undescribed, is as follows :

Puccinia Cheiranthi, E. & E.—On *Cheiranthus pygmaeus*, Grinnell Land. III. Sori hemispheric, brown, naked, $\frac{1}{2}$ — $\frac{3}{4}$ mm. in diameter, thickly scattered over both sides of the leaves, but (in the specimen examined) not confluent. Spores oblong or clavate-oblong, light brown, constricted at the septum, 35—53 x 15—22 μ , either consisting of two subequal cells, or, oftener, the upper cell broader and shorter (subglobose), and the lower one tapering into the stout, rather persistent pedicel, which is about as long as or a little longer than the spore itself; episore smooth or faintly but rather coarsely roughened above, thickened and lacerated at the apex so as to resemble somewhat the remains of the calyx on a currant or huckleberry. I. and II. not seen. This appears to be sufficiently distinct from the other species on the Cruciferae.

“THE ÆCIDIUM OF ADOXA.” By J. C. Arthur, l. c.

Plants of *Adoxa Moschatellina* were sent from Iowa to Geneva, N. Y., where was tested the suggestion that *Æcidium albescentis*, Grev. (a state of *Puccinia Adoxæ* DC., according to European botanists, but the latter has not been found in this country) might be perennial in the subterranean stems of *Adoxa*. The host plants were entirely covered with the æcidia, and continued to harbor them till the leaves dropped off in the Fall. The pot containing the plants was sunk out of doors till the ensuing March, when it was again put in the greenhouse and it at once started into vigorous growth. Up to September no æcidia had appeared, showing apparently that *Æ. albescentis*, Grev., is an annual.

"NOTES ON BLACK-KNOT." By A. A. Crozier, Ann Arbor, Mich., 1. c.

First examination (of *Plowrightia morbosa*) January 6, asci considerably developed and spores beginning to form. First of March, most of the asci contained spores, but unripe. Most spores the middle of May, and they were furnished with thicker, dark-colored walls. Ascospores continued to be formed till June 17. Knots on wild plum contained no live perithecia. In a few cases the knot was found on *Prunus serotina*.

"PROOF THAT BACTERIA ARE THE CAUSE OF THE DISEASE IN TREES KNOWN AS PEAR BLIGHT." By J. C. Arthur, 1. c.

"NOTES ON SOME INJURIOUS FUNGI OF CALIFORNIA." By W. G. Farlow, 1. c.

An account is given of *Peronospora Hyoscyami*, De By., found by Dr. Farlow abundantly on *Nicotiana glauca*, Grah. The latter "may perhaps spread northward and eastward until it reaches the Gulf States, carrying with it the *Peronospora*, but it is too tender to stand the winters further north without protection. What is also to be feared is, that in advancing eastward, the fungus may be communicated to some species related to the *N. glauca*, as, for instance, *Hyoscyamus niger*, and thus be transported north of the limit, where the *N. glauca* might grow, but where *N. Tabacum* (the Tobacco plant) is cultivated. But this supposition is almost superfluous, because if *N. glauca* and its parasite are once introduced into the Gulf States the parasite might attack the tobacco grown there, and then pass on to Virginia and other States where Tobacco is the most important crop."

Peronospora Halstedii, Farlow, grows on *Madia sativa* near San Francisco, thus extending across the continent. *Puccinia Malvacearum*, Mont, was first seen by Mr. D. Cleveland in 1875, near San Diego, and since by others there and elsewhere, on *Malvastrum*. Though this form has been named by Prof. Peck, P. Malvastri, Dr Farlow seems to be of the opinion that it is only a variety of *P. Malvacearum*, Mont. It is curious, however, that this western variety and not the typical form, or European species, was found on the hollyhocks at Santa Barbara.

"EXOBASIDIUM WORONIN." Von H. Karsten. Botanisches Centralblatt, Band XXIII, No. 12.

"EINIGE NEUE PILZ-SPECIES UND VARIETÄTEN AUS SLAVONIEN."

- Von Stephan Schulzer von Mueggenburg. Hedwigia, 1885, Heft IV.
- "MYXOMYCETEN DER TATRA." Von M. Raciborski in Krakau, l. c.
- "EINE NEUE PUCCINIA." Von Prof. C. A. J. A. Oudemans,
 Latin diagnosis of *Puccinia Veronicæ Anagallidis*, n. s. differt a *P. Veronicæ* forma sporarum magis condensata, præprimis vero absentia absoluta cujusvis adpencilis cuculliformis vel conoidei pallidioris in eacumine loculamenti superioris.
- "FIRST DISCOVERY OF THE CHOLERA BACILLUS." By Francis Fowke, F. R. M. S., Midland Naturalist, Sept. 1885.
- "THE MYCOLOGIC FLORA OF THE MIAMI VALLEY, OHIO." By A. P. Morgan. Journal of the Cincinnati Society of Nat. Hist. Vol. VIII. p. 168, continued from Vol. VIII, p. 110. Polyporus continued, and Myriadoporus.
- "NONNULLI FUNGI PARAGUAYENSES A BALANSA LECTI." Auctore Dr. G. Winter. Revue Mycologique, Octobre, 1885.
- "CHAMPIGNONS NOUVEAUX DE L'AUBE, FASC. I." Major Briard, l. c.
- "FUNGI GALlici EXSICCATTI.—CENTURIE XXXVe." C. Roumeguere, l. c.

"NOTE SUR UN NOUVEAU GENRE ET QUELQUE NOUVELLES ESPECES DE PYRENO MYCETES," par M. E. Boudier, l. c.

The new genus (of which one species is given, *R. variospora*, Boud., frequens ad radices *Asparagi officinalis* ad latera viarum dejectas) is described as follows: *RICHONIA* gen. nov.—Perithecia semper repleta. firma, sparsa, superficialia, carbonacea. ostoma supra rotundata, subtus depressa, intus grumosa. Thecæ clavatæ, crassæ, 2—6-sporæ, mox resolutæ. Sporæ majores, didymæ, loculis rotundatis obtusæ, ad septum constrictæ, primo leves, hyalinæ, guttulatæ, dein filamentosæ, marcescentes olivascentes, denique maximæ, aterrimæ, rugulosæ et diffformes Parphyses numerosæ, tenues, ramosissimæ et intricatæ, thecas et sporas circumdentes.

Genus *Perisporacearum* hypogæum (?) rhizophylum, a genere *Zopfia* sporis filamentosis non appendiculatis et thecis clavatis omnino diversum.

"THE SPOT DISEASE OF STRAWBERRY LEAVES." By William Trelease. Extr. from the Second Annual Report of the Wisconsin Experiment Station.

An account of the *Ramularia Tulasnei*, Sacc., its structure, growth ravages, etc. Illustrated by three figures, one of a leaf, natural size, showing the white spots; a second showing a tuft of spore-bearing threads emerging through a stoma, and a third giving a section through two sclerotia or *Ramularia Tulasnei*, Sacc., on a diseased strawberry leaf.

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No. 12.

SYNOPSIS OF THE NORTH AMERICAN SPECIES OF *ASTERINA*, *DIMEROSPORIUM* AND *MELIOLA*.

BY GEORGE MARTIN.

[Continued from page 139.]

DIMEROSPORIUM.

DIMEROSPORIUM, Fekl. Symb. Myc. p. 89. (Etym. *dis*, *meros* and *spora*, a spore divided into two parts.) Perithecia superficial, globose, astomous, membranaceo-carbonaceous; mycelium copious, subcrustaceous, black, bearing conidia. Asci short, 8-spored; sporidia didymous, hyaline or brown. Sacc. Sylloge I, p. 51.

This genus is made up principally of species taken from *Asterina* and *Meliola*, and though this separation appears at best to be an arbitrary one, it has been thought that less confusion might arise by adopting it for the present.

1. *DIMEROSPORIUM CLAVULIGERA* (Cke.), *Asterina clavuligera*, Cke., Grev. VI, p. 142. Ravenel F. A., No. 76.

Mycelium brown black, remotely septate, branching, epiphyllous. spots orbicular, often coalescing, crustaceous, conidia light brown, obovate, 3-septate, pedicel hyaline, 45—48 x 9—12 μ ; perithecia black, subglobose, becoming depressed and at last scutellate from rupture, 250 μ in diameter consisting of coalesced brown black, radiating hyphæ, covering a light brown, membranous sac; asci oval, 30 x 18 μ ; sporidia hyaline, oval or obovate, 1-septate, 21 x 6 μ .

On leaves of *Vaccinia* and *Andromeda*, Florida.

2. *DIMEROSPORIUM CAPNOIDES* (Ell.) *Asterina capnoides*, Ellis. Am. Nat. 17, p. 318.

Mycelium brown black, branching, septate, hypophyllous; conidia brown, oval, 1-septate, 10—12 x 6 μ ; macro-conidia brown, pedicellate,

submuriform, 3-septate, 35–15 μ ; perithecia brown black, subglobose, 50–100 μ in diameter; asci oblong-oval, sessile, 8-spored, 35–40 x 11–16 μ ; sporidia hyaline, subcymbiform, 1-septate, 2-seriate, 10–17 x 4–6 μ .

On living leaves of *Asclepias Cornuti*, Kansas.

3. DIMEROSPORIUM COLLINSII (Schw.) Theum., M. U. No. 840. *Sphaeria Collinsii*, Schw. Syn. N. Am. 1512. Peck, 29th Rep. N. Y. State Mus., p. 59.

Mycelium brown black, septate, crustaceous, hypophyllous, covering the whole surface; perithecia black, globose, closely aggregated, 150–160 μ ; asci cylindrico-clavate, 8-spored, 45–60 x 10 μ ; sporidia hyaline, oval, 1-septate, 2-seriate, 12–15 x 3–4 μ .

On leaves of *Amelanchier Canadensis*, and *A. alnifolia*, New York, Mass., and Sierra Nevada Mts., California.

4. DIMEROSPORIUM ELLISII, Sacc. *Meliola maculosa*, Ellis, Sylloge 1, p. 54. Bull. Torr. Bot. Club, 8, p. 91. *Venturia maculosa*, Ellis, N. A. F. No. 200.

Spots black, suborbicular, hypophyllous, 2–3 mm. in diameter; perithecia black, globose, 90–115 μ in diameter, borne upon a brown, flexuous, remotely septate mycelium, with a circle of straight, black setæ at the base, structure cellular, setæ 100 x 5, apices entire; asci cylindrical, 8-spored, 50–60 x 10 μ ; sporidia ellipsoid, didymous, hyaline, mostly 1-seriate, 10–12 x 4 μ .

On fallen leaves of *Andromeda* (?), New Jersey.

5. DIMEROSPORIUM MELIOLOIDES (B. & C.) *Asterina melioloides*, B. & C. Gräv. 4, p. 10. *Meliola Baccharidis*, B. & Rav. Gräv. 4, p. 158.

Perithecia brown black, globose, rugulose, astomous, epiphyllous, clustered, 80–95 μ in diameter, borne upon brown, radiating hyphæ; asci cylindrico-clavate, 8-spored, 33–40 x 10–13 μ ; sporidia hyaline, subcymbiform, 1-septate, 1–2-seriate, 10 x 3 μ .

On leaves of *Baccharis halimifolia*, Florida.

6. DIMEROSPORIUM ORBICULARIS (B. & C.) *Asterina orbicularis*, B. & C. Gräv. 4, p. 9. Ravenel F. A., No. 74. Ellis N. A. F., No. 1362.

Mycelium black, branching, remotely septate, adnate, spots orbicular, crustaceous, often coalescing; perithecia black, subglobose, 80–100 μ in diameter, amphigenous, but those on the upper surface are of a dull black color, and often sterile; structure of black, septate, radiating hyphæ, in the nucleus, spreading from the apex to the circumference, are numerous moniliform threads, of subglobose, dusky cells, 10–12 μ in diameter; asci ovate or obovate, 8-spored; sporidia oval, oblong, 33–36 x 15–18 μ , hyaline at first, then light brown.

On leaves of *Ilex coriacea* and *I. opaca*, Carolina to Florida.

MELIOLA.

MELIOLA, Fr. (Etym. *melon*, from the form of the perithecia.)

Perithecia borne upon spots of superficial, grumous, radiating, black mycelium, globose, astomous, membranaceous, bristley or often *appended*

by a circle of setæ. Asci frequently short, thick, 2—8-spored, without paraphyses. Sporidia typically oblong, 2—5-septate, dusky, but sometimes fenestrate, hyaline or dusky. Sacc., Sylloge 1, p. 60.

1. MELIOLA AMPHITRICHIA, Fr. Ravenel F. A., No. 82. Ellis N. A. F., No. 1296 and 1296 b.

Spots black, crustaceous, orbicular, often confluent, amphigenous, mostly hypophyllous, mycelium brown black, remotely septate, radiating, with short, pyriform, 1-septate, alternate branches; perithecia black, globose, then depressed and at length collapsing, rugulose, 200—250 μ in diameter, circled by black, opaque, rigid, erect setæ, 300—500 x 9—12 μ ; asci oval, 2-spored, evanescent; sporidia oblong, dusky, 4-septate, constricted at the septa, 50—56 x 16—24 μ .

On *Persea*, *Cladium*, *Olea Americana*, &c.

2. MELIOLA COOKEANA, Speg. *M. amphitricha*, Fr., Ravenel F. A., No. 84. Ellis N. A. F., No. 1295.

Mycelium amphigenous, broadly and irregularly effused, subcrustaceous, black, easily separating when mature, hyphæ thick, branching, intricate, remotely septate, also with short pyriform, 1-septate, alternate branches; fertile hyphæ few, rigid, often only in a circle around the perithecia, 1-spored, apices entire, 120—250 x 8—10 μ (conidia deficient); perithecia scattered or aggregated, globose, black carbonaceous, bald, scaly, granular, 150—200 μ in diameter; asci elliptic, short and thick, stipitate, 2-spored, often immature; sporidia at first hyaline then brown, oblong, 4-septate, constricted at the septa, 30—40 x 10—12 μ .

On living leaves of *Callicarpa Americana*, Florida.

3. MELIOLA CRYPTOCARPA, E. & M. Am. Nat. 17, p. 1284. Ellis N. A. F. No. 1293.

Spots mostly epiphyllous, suborbicular, 2—4 mm. in diameter, numerous and often confluent; mycelium pale brown, creeping, septate, irregularly branched, bearing numerous, oblong-fusiform conidia, pale brown, 3—4-septate, 30—40 x 5—9 μ , obtuse or acute above and contracted below into a short, hyaline stipe; erect bristles abundant, simple, multiseptate, black, tips entire and paler; perithecia black, subglobose, not abundant and often sterile, 180—200 μ in diameter, collapsing, surrounded at base with a few diverging, brown, septate appendages, which, like the bristles, are more or less crisped or undulate above. Asci oblong, ovate, 8-spored; sporidia brown, oblong, or oblong-clavate, 2-seriate, 3—5-septate, 30—50 x 10—12 μ .

On leaves of *Gordonia Lasianthus*, Florida.

4. MELIOLA FENESTRATA, C. & E. Grev. 5, p. 95.

Subgregarious. Perithecia subglobose, brown, often quite smooth, sometimes with a few rigid, subulate, brown hairs equal in length to the diameter of the perithecia, 100—150 μ , hyphæ brown, radiating from the base; asci not seen, sporidia elliptic, multiseptate, fenestrate, brown, 30—40 x 12 μ . The whole surface of the scale stained dark brown.

On scales of pine cones, New Jersey.

5. *MELIOLA FURCATA*, Lev. Ravenel, F. A., No. 330. Ellis, N. A. F., No. 1297.

Spots orbicular, mostly epiphyllous, often confluent and covering nearly the entire surface; mycelium brown, creeping, remotely septate, branching, intricate also with short, obovate, 1-septate, alternate branches; perithecia black, globose, often thickly clustered, at length collapsing, appendaged, 150 μ in diameter; appendages black, erect, rigid, apices twice dichotomous, 200 x 6 μ ; asci ovate, rostrate, 4-spored, evanescent; sporidia brown, oblong, 4-septate, constricted at the septa, 40—60 x 15—20 μ .

On leaves of *Bignonia capreolata* and *Sabal serrulata*, Florida.

6. *MELIOLA MANCA*, E. & M. Am. Nat. 17, p. 1284. Ellis, N. A. F., No. 1292.

Spots orbicular, 1—2 mm. in diameter, mostly epiphyllous, thickly scattered and often confluent; mycelium black, creeping, branches opposite, also short-obovate, alternate branches (haustoria); perithecia black, subglobose, papillose, collapsing, appendages and erect hyphæ none; asci ovate-oblong, mostly 2-spored; sporidia oblong-cylindrical, brown, 3-septate, constricted at the septa, slightly curved and a little flattened, 35—45 x 12—15 μ .

On living leaves of *Myrica cerifera*, Florida.

7. *MELIOLA MITCHELLÆ*, Cke. Ravenel, F. A., No. 88. Ellis, N. A. F., No. 1294.

Spots black, thin, mostly epiphyllous, often covering the entire surface, mycelium dark brown, branching, intricate, also with short, ovate, alternate, 1-septate branches; erect hyphæ, simple, dark brown, setaceous, apices entire, 250 x 6 μ ; conidia light brown, obovate or clavate, 3-septate, 27—30 x 4 μ , borne upon erect, light brown, subhyaline hyphæ; perithecia black, globose, smooth, 100—125 μ in diameter; asci cylindrico-clavate, 39 x 9 μ ; sporidia oblong-elliptic, brown, 4-septate, 35 x 15 μ .

On leaves of *Mitchella repens*, Florida.

8. *MELIOLA TENUIS*, B. & C. Grev, 7, p. 49.

On *Arundinaria*. Ravenel, F. A., No. 330, Georgia.

This appears to be *Meliola amphitricha*, Fr.

NEW FUNGI.

BY J. B. ELLIS AND B. M. EVERHART.

[Continued from page 141.]

LOPHIOSTOMA ROSEOTINCTUM, E. & E.—On dead twig and limbs of *Staphylea trifolia*. Perithecia gregarious, hemispheric or subglobose, subcarbonaceous, black and roughish, $\frac{1}{2}$ mm. diameter, with a slightly prominent, compressed ostiolum, covered at first by the epidermis which assumes a dull rose colored tint over that part of the stems occupied by the fungus. Asci clavate-cylindrical, subsessile. 100—112 x 13—15 μ ;

paraphyses filiform. Sporidia cylindrical-fusiform, pale yellow, 2-seriate, constricted and 1-septate in the middle, each division with 4—5 large nuclei, and each end tipped with a small, subglobose appendage. The perithecia are at length emergent or superficial when the epidermis disappears.

HYMENOCHÆTE FIMBRIATA, E. & E.—On dead *Pinus Murrayana*, Yellowstone Park, Montana, 1885. Collected by Frank Tweedy. Resupinate, suborbicular, 2—8 cm. diameter, margin umber brown, laciniately divided so as to be coarsely fimbriate; hymenium silver gray, the whole forming a thick, tough, membranaceous layer which is partially separate from the matrix. The hymenium is composed of a densely compacted layer of erect threads, with obtuse and slightly swollen tips, giving the surface a velvet-like texture. Part of these threads are hyaline and part umber or chestnut brown. The former are a little longer and thus give the peculiar gray tint to the hymenium which, when examined with a lens, or seen with the naked eye, has the appearance of being overrun with a white mould.

ZYGODESMUS INDIGOFERUS, E. & E.—On very rotten wood, West Chester, Pa., Sept. 1885. Forming a thin, loose, submembranous stratum, indigo blue, becoming greenish yellow, margin byssoid. Flocci slender, branched, septate, mostly less than 3 μ in diameter. Spores globose, smooth on short basidia (8—10 x 3 μ .) Approaches *Thelephora*.

DACRYMYCES CORTICIOIDES, E. & E.—On rotten pine logs and limbs, Newfield, N. J., Oct., 1885. Suborbicular, 2—5 mm., convex-applanate, often subumbilicate-depressed in the center, pale, subvelutinous and with an even surface when young, becoming pale orange and when confluent, as it often is, more or less plicate, apparently from mutual pressure. Basidia cylindrical, more or less dichotomously branched, 100 μ long or more by about 4 μ thick. Spores oblong-elliptical with an oblique apiculus, becoming uniseptate, 12—17 x 4—5 μ . Looks much like overgrown specimens of *Helotium confluens*, Schw., or *H. citrinum*, Fr., when fresh, and in the dry state resembles a *Corticium* with a narrow, white, subbyssoid margin. The orange color deepens in drying.

LOPHIOSTOMA ROSEOTINCTUM, E. & E.—On dead twigs and limbs of *Staphylea trifolia*. Perithecia gregarious, hemispheric or subglobose, subcarbonaceous, black and roughish, $\frac{1}{2}$ mm. diameter, with a slightly prominent, compressed ostium, covered at first by the epidermis which assumes a dull, rose-colored tint, over that part of the stems occupied by the fungus. Asci clavate-cylindrical, subsessile, 100—112 x 13—15 μ ; paraphyses filiform. Sporidia cylindrical fusiform, pale yellow, 2-seriate, constricted and 1-septate in the middle, each division with 4—5 large nuclei, and each end tipped with a small, subglobose appendage. The perithecia are at length emergent or superficial, when the epidermis disappears.

WINTERIA CRUSTOSA, E. & E.—On decorticated oak, West Chester, Pa., June 1879. Perithecia membranaceous. $\frac{1}{2}$ — $\frac{1}{2}$ mm., depressed hemi-

spheric, tuberculose, and roughly laciniate-cleft above, seated on and partly connected by a thin, crustose, black subiculum more or less distinct. Asci clavate-cylindrical, $65-80 \times 10 \mu$. Paraphyses filiform (?) soon resolved with a mass of granular matter. Sporidia biseriata, fusiform, $20-25 \times 4-5 \mu$, yellowish or hyaline with a faint, gelatinous envelope; endochrome divided in the middle, exceptionally 3-times divided. The perithecia collapse when dry so as to resemble a *Peziza* with an obtuse margin. Ostiolium not very conspicuous, papillose-conic, with 4-5 more or less distinct furrows radiating from it. Allied to *Winteria ordinata*, Fr., but differs in its shorter, mostly 1-septate sporidia, and depressed perithecia.

PHYSALOSPORA ORONTII, E. & E.—On dead spots in living leaves of *Orontium aquaticum*, Newfield, N. J., July, 1885. Spots elongated, dead and dry, $3-4 \times 1$ cm. Perithecia erumpent, orbicular, flattened, $150-180 \mu$ in diameter, pierced in the center with a small, round opening, texture membranaceous. Asci oblong-cylindrical, with an acute, sessile base and rather abruptly narrowed, truncate apex. Paraphyses ? Sporidia biseriata and closely packed, granular, subhyaline, $14-16 \times 6-7 \mu$. *Ramularia Orontii*, E. & M., and *Phyllosticta Orontii*, E. & M., are not improbably connected with this as conidia and spermogonia.

OPHIOBOLUS MEDUSA, E. & E.—Perithecia membranaceous, scattered, depressed-globose, $\frac{1}{2}-\frac{1}{2}$ mm. in diameter, covered by the epidermis which is not discolored nor elevated but barely pierced by the black, punctiform ostiolium. Asci very long (400μ and over) by $12-15 \mu$ broad) containing 8 filiform, curved sporidia nearly as long as the asci and $3-3\frac{1}{2} \mu$ thick in the middle, gradually tapering to each end, yellowish or nearly hyaline, with endochrome multipartite. The perithecia lie in the furrowed cavities of the culm, attached above to the inner surface of the cuticle and covered with loose, spreading, weak, brown, septate hairs, $200-400 \mu$ long by about 3μ thick. On stems of *Spartina*, lying partly buried in the sand on the beach at Cape May, N. J. Collected by Mrs. Caroline Treat, during the summer of 1885.

OPHIOBOLUS STAPHYLINUS, E. & E.—On decorticated stems of *Staphylea trifolia*, West Chester, Pa., Sept. 1885 (Everhart.) Perithecia small, covered by the fibers of the wood through which project the short, straight, roughish, black, rostellate ostiola. Asci linear, $120-160 \times 4 \mu$, accompanied by filiform paraphyses. Sporidia 8 in an ascus, filiform, yellowish, nucleolate and about as long as the asci.

On the same stems is a *Sphaeropsis* with oblong, depressed perithecia, and spores $18-20 \times 8-9 \mu$, and other small perithecia partly covered by the fibres of the wood and containing numerous elliptical, subfuscous, $3 \times 2 \mu$ spores.

LEPTOSPLERIA RUBROTECTA, E. & E.—On dead twigs of *Staphylea trifolia*. Perithecia scattered, membranaceous, depressed globose, $200-250 \mu$, perforated above, covered by the slightly elevated epidermis which is slightly ruptured, and stained pale blood red. Asci clavate-cylindrical,

sessile, 100—110 x 10—13 μ , sessile and accompanied by paraphyses. Sporidia biserial, cylindrical, straight or slightly curved, deep straw yellow. 8—10-septate with one joint (a little below the middle) slightly swollen. 25—40 x 4—5 μ , ends subobtus. Distinguished by its sporidia from all the other red-tinged species.

HENDERSONIA STAPHYLEÆ, E. & E.—With the preceding, in perithecia scarcely to be distinguished from the ascigerous ones, unless a little larger, spores oblong obtuse, straight or slightly curved, 3-septate and dark brown. Probably the pycnidial stage of the *Sphæria*.

SPHÆRELLA ORONTII, E. & E.—On yellowish spots on living leaves of *Orontium aquaticum*, Newfield, N. J., July, 1885. Perithecia epiphyllous, scattered, minute (100 μ), purplish black, membranaceous, coarsely cellular, perforated above, partly erumpent. Asci oblong, a little narrower above and abruptly contracted below into a very short, stipe-like base, 35—40 x 10—12 μ , without paraphyses. Sporidia biserial, oblong, hyaline, nucleate and faintly 1-septate, about 14 x 4—5 μ , a little narrower at one end. *Physalospora Orontii* has larger perithecia and rather larger, regularly elliptical, continuous sporidia.

SPHÆRELLA CENOTHERÆ, E. & E.—On old capsules of *Oenothera biennis*, Newfield, N. J., July, 1885. Perithecia erumpent, hemispheric. 90—100 μ , broadly perforated above, densely gregarious and mostly in broad strips or series on the valves of the capsules. Asci oblong, slightly narrower above and abruptly contracted below into a short, stipe-like base. Sporidia biserial, variable from oblong or ovate-oblong, 10—15 x 3 μ and nucleate to oblong fusiform, slightly curved, faintly uniseptate and 15—20 x 3—3½ μ . The smaller ones are apparently immature, being without septa.

AILOGRAPHUM CÆSPITOSUM, E. & E.—On bare wood of old cypress pickets, Louisiana. A. B. Langlais, 196a; com. Prof. F. L. Scribner. Growing in small (1 mm.) suborbicular clusters, on a subcrustose, slightly prominent, black stroma, presenting the general appearance of an erumpent *Sphæria*. Perithecia minute (¼ mm. or less in length), applanate, opening with a rather broad cleft, the base mostly bordered with brown, creeping threads. Asci ovate, sessile, 30 x 15 μ ; sporidia crowded, oblong-fusiform, obtuse, hyaline and uniseptate at first, becoming brown at length and often 3-septate, 15—20 x 3—5 μ , constricted at the septum. Differs from the usual type of *Ailographum* in the sporidia becoming brown.

PEZIZA CYPHELLOIDES, E. & E.—Parasitic on the teeth of old *Hydnum* (*membranaceum*?) Newfield, N. J., Oct., 1885. Subsessile, minute. (¼—½ mm.) when fresh, soft, white, pubescent, margin incurved, texture fine, cellular. Asci cylindrical, branched below, spore bearing part 12—15 x 1½ μ or including the branching, stipitate base, 24—30 μ long. Spores globose, 8 in an ascus, about 1 μ in diameter. Paraphyses none. The specimens were accompanied by *Penicillium glaucum*, Lk., the spores of

which are much like those of the *Peziza* only a little larger. In drying, the plant shrinks down to a mere white speck. Much resembles a *Cyphella*, but the cylindrical bodies containing the spores seem to us to be genuine asci. The plant appears to belong in the section *Mollisia*.

PEZIZA (HUMARIA) CESTRICA, E. & E.—On the ground among moss, West Chester, Pa., Aug. 28, 1885. B. M. Everhart, No. 512. Cæspitose, orange yellow, soft, sessile, orbicular or somewhat irregular from mutual pressure, about $\frac{1}{2}$ cm. diameter, concave, with the disk subplicate in the center, smooth or slightly pruinose outside, margin obtuse, texture coarsely vesiculose. Asci cylindrical, sessile, 115–125 x 7–8 μ . Paraphyses rather abruptly thickened, yellow and curved at the tips. Sporidia uniseriate, occupying the upper half of the asci, coarsely echinulate-roughened, binucleate and with a short, straight apiculus at each end, length including the apiculus 11–11 $\frac{1}{2}$ μ , breadth 4–5 μ .

Peziza Chaeteri, Sm., has sporidia much like this, only wanting the appendages.

PATELLARIA SUBVELATA, E. & E.—On bark of living coniferous trees, Wash. Terr. W. N. Suksdorf (No. 210). Com. C. J. Sprague. Subcuticular at first, at length exposed, about $\frac{1}{2}$ mm. diameter, black, thin, margin obscure. Asci 50–60 x 14–16 μ ; paraphyses yellowish, bearing at their tips numerous subglobose, small, dark brown conidia which form the superficial layer of the disk. Sporidia clavate-fusoid, slightly curved, broadest and rounded above, running almost to a point below, yellowish, endochrome about 4 times divided, 25–30 x 3 $\frac{1}{2}$ –4 μ . The general appearance is much like that of *Sphaeria squamata*, C. & E.

This and the preceding species stand on the boundary line between lichens and fungi, but for the present at least, we include them here.

PATELLARIA CAROLINENSIS, E. & E.—On bleached wood, So. Carolina. H. W. Ravenel, 680. Sessile, orbicular, black, roughish, 1.6– $\frac{1}{2}$ mm., convex when moist, plane and concave when dry, margin obsolete. Asci oblong, 40–45 x 8–10 μ , broadest and rounded above, abruptly contracted below into a short, stipitate base; paraphyses abundant, stout, overtopping the asci, much branched above, their tips bearing brown, subglobose conidia which form a continuous layer and give a dark color to the disk. Sporidia 8 in an ascus, filiform-cylindrical, multiseptate, pale yellowish, rather broader at the upper end and nearly as long as the asci.

PATELLARIA LEUCOCHÆTES, E. & E.—On basal sheaths of dead *Andropogon*, Newfield, N. J., Nov. 1885. Appearing at first in the form of minute tufts of spreading, white hairs, in the midst of which soon appears the soft, orange-colored, convex-tuberculiform, immarginate hymenium, $\frac{1}{2}$ – $\frac{3}{4}$ μ in diameter. Asci oblong-cylindrical, 75–85 x 13–15 μ , sessile and surrounded by simple paraphyses only slightly thickened above. Sporidia fasciculate, cylindrical, nearly hyaline, nucleate and soon faintly multiseptate and slightly constricted at the septa, 75–80 x 4

— $4\frac{1}{2}$ μ , the upper end rounded and obtuse, the lower end subacute. The hairs which remain as a fringe around the margin of the tuberculiform hymenium are without septa, undulate or crisped and about $2\frac{1}{2}$ μ in diameter. This varies considerably from the usual type of *Patellaria*.

VENTURIA GAULTHERIÆ, E. & E.—On living leaves of *Gaultheria procumbens*, Newfield, N. J., July. On orbicular, dark brown, $\frac{1}{2}$ mm. spots which are mostly of a lighter color (gray) in the center. Perithecia scattered, orbicular (75 μ), membranaceous and rather coarsely cellular, with a few, black, continuous, straight, spreading, 35×3 μ bristles above. Asci ovate-oblong, $30-35 \times 8-11$ μ , broader and slightly curved below, sessile, without paraphyses. Sporidia biseriate, subhyaline (with a greenish yellow tint), ovate-oblong, 3—4 nucleate, 1-septate and slightly constricted at the septum, $11-14 \times 3$ μ .

PHYLLOSTICTA GAULTHERIÆ, E. & E.—On living leaves of *Gaultheria procumbens*, Newfield, N. J., July, 1885. Spots amphigenous, scattered, dark reddish-purple, small (1—2 mm.), with a still darker purplish border. Perithecia amphigenous, sublenticular, black, coarsely cellular, slightly prominent, covered by the cuticle, $100-115$ μ . Spores elliptical, hyaline, granular, $5-7 \times 4-5$ μ .

CHÆTOMELLA (?) PERFORATA, E. & E.—Perithecia superficial, subglobose ($\frac{3}{4}-\frac{1}{2}$ mm.) with a small, circular opening above, sparingly clothed with straight, black, continuous, bristle-like hairs about equal in length to the diameter of the perithecia, more thickly set around the orifice, paler and more or less substellate-tufted below; spores very variable, from short oblong to oblong-elliptical, 10 μ long and uniseptate to 30 μ long and 3-septate, about 4 μ wide, constricted at the septa and having in the mass a rosy hue. Differs from the type of *Chaetomella* in its perforated perithecium and septate spores. On *Cirsium discolor*, Charles City, Iowa, Sept., '82, Prof. J. C. Arthur, and on *Cirsium altissimum*, and *Artemisia Ludoviciana*, Ames, Iowa, Prof. C. E. Bessey.

STILBUM ACICULOSUM, E. & E.—On decaying leaves of *Orontium aquaticum*, Newfield, N. J., July 22d, 1885. Acicular, white, stem somewhat swollen towards the base, and about 40 μ thick, gradually tapering above to 12 or 15 μ thick, $\frac{3}{4}-1$ mm. high, composed of hyaline, compacted fibers, of which the free ends of some project like bristles along the sides of the stem. Head obovate, about 75 μ high and $60-75$ μ thick, spores oblong-elliptical, hyaline, $5-6 \times 1\frac{1}{2}$ μ , borne in a dense stratum at the ends of the hyphæ.

STILBUM CORYNOIDES, E. & E.—On *Hypoxylon tinctor*, Berk, Louisiana, A. B. Langlais, 29, com. Prof. F. L. Scribner. Stem slender, flexible, black but covered with a glaucous bloom, of fibrous texture, finely divided above and spreading into the close, spherical, flesh-colored head ($\frac{3}{4}-\frac{1}{2}$ mm.) which is formed of the conglutinated, oblong-oval or elliptical $4-5 \times 2\frac{1}{2}$ μ spores. The fungus does not grow directly from the Hypoxylon but springs from under the margin of bark and lichens surrounding it.

STILBUM ECHINATUM, E. & E.—Parasitic on *Arcyria cinerea*, Adirondack Mts., N. Y., Aug. 1884 and 1885. Coll. by Dr. Geo. A. Rex. Projecting horizontally (for the most part) from decaying heads of the *Arcyria* and thus causing them to appear echinate. White throughout; stem $300-350 \times 30-40$ μ , straight; head globose, $100-115$ μ diameter. Spores globose, minute ($\frac{1}{2}$ μ). *S. tomentosum*, Schrad., is a much coarser plant with oblong spores $4-5 \times 1\frac{1}{2}$ μ .

KELLERMANIA, E. & E., nov. gen.

Perithecia immersed, membranaceous, ostiolate; stylospores cylindrical, large, septate, stipitate. Genus dedicated to Dr. W. A. Kellerman, its discoverer.

KELLERMANIA YUCCÆGENA, E. & E.—On dead or withered leaves of *Yucca augustifolia*, Manhattan, Kansas, June, 1885. Perithecia membranaceous, about .2 mm. in diameter, globose, buried in the substance of the leaf and only visible outwardly as small, dusky circles with a black spot in the center, caused by the minute, papilliform ostiolum barely visible through the slightly ruptured epidermis. Spores cylindrical, granular, 45–50 x 10–12 μ , abruptly contracted below into a slender, stipe-like base, 18–25 μ long. The granular contents are divided by a septum across the middle with indications of becoming faintly multi-septate. The outward appearance is the same as that of *Sphaeria nigro-annulata*, B. & C. The specimens in N. A. F. 1366, are this species in some copies.

If the cylindrical spores can be considered as asci, the species will be referable to *Julella*, Sacc., but they seem to be really stylospores.

NEW LITERATURE.

BY W. A. KELLERMAN.

“RABENHORST-WINTER, FUNGI EUROPEI,” 32d Cent.

This splendid collection of fungi, indispensable to the American Mycologist, contains in the thirty-second Century 47 specimens that were collected in this country. In connection with seven of the species which are new to the literature of science, Dr. Winter has given also descriptions. They are as follows: *Puccinia Macowani*, Winter, I and III. in foliis vivis *Helichysi petiolati*, England; *Æcidium splendens*, Winter, in cotyledonibus vivis *Crotonis mononthagyni*, Missouri; *Peziza Ulei*, Winter, ad folia viva *Gleicheniæ dichotomæ*, Brazil; *Parodiella cæspitosa*, Winter, ad folia viva compositis scandentis adhuc indeterminata, Brazil; *Diplodia maculicola*, Winter, ad folia viva *Leguminosæ* adhuc indeterminatæ, Brazil; and *Sphaerella convexula* (Schw.)—whose asci and spores were hitherto undescribed—ad folia arida *Caryæ amaræ*, Ohio.

“KRYPTOGAMEN FLORA VON DEUTCHLAND, OESTERREICH UND DER SCHWEIZ. PILZE VON DR. G. WINTER. 20. LIEFERUNG.”

This Lieferung of the II part, Vol. I, contains pp. 385–448, including a portion of the *Pyrenomyces* (*Sphaeriaceæ*). This carefully edited work of Dr. Winter's is doubtless too well known to American botanists to need a full account here.

“CHAMPIGNONS COPROPHILES DE LA BELQUIQUE. PAR ELIE MARCHAL, 1884-5.” Pp. 45, 4 plates.

“ALGOLOGISKA OCH MYKOLOGISKA ANTECKNINGAR FRÅN EN BOTANISK RESA I LULEÅ LAPPMÅRK. ÅF G. LAGEAHEIM.” Konigl. Vetenskaps Föreläsningar, 1884.

“MYKOLOGISKA BIDRAG. ÅF G. LAGERHEIM.” Separataftryck ur Botanska Notiser, 1884.

“FUNGI MORICOLÆ. ICONOGRAPHIA E DESCRIZIONE DEI FUNGHI PARASSITI DEL GELSO DI AUGUSTO NAPOLEONE BERLESE. Fascicolo I, II.”

This small book cannot be too highly commended as to the execution of the numerous colored lithographic plates. The figures were drawn from nature by Sign. Berlese. They are accompanied with Latin descriptions of the species, and observations printed in the Italian language.

"OBSERVATIONS ON SEVERAL ZOOGŁEÆ AND RELATED FORMS. By William Trelease, Sc. D." Reprinted from the Studies from the Biological Laboratory of the Johns Hopkins University, Vol. III. No. 4, pp. 193-216. One plate.

Of the several species studied, the following are proposed as new : *Bacterium candidum*, Trelease ; *B. aurantiacum*, Trelease ; *B. luteum*, Trelease ; *B. chlorinum* (Cohn ?) Trelease ; *B. incarnatum*, Trelease ; and *Saccharomyces glutinis* (Fres.), var *candidus*, Trelease.

"REPORT OF THE STATE BOTANIST, CHAS. H. PECK." Pp. 77-138, in 38th An. Rep. on the N. Y. State Museum of Nat. Hist. Three plates.

These well known and invaluable Reports are anxiously looked for by all botanists. Space can not in this number be given to the reproduction of Prof. Peck's new species, of which he gives descriptions of sixty-three. He proposes a new genus as follows :

Appendicularia, Peck, nov. gen.—Perithecium thin, delicate, rostrate, supported on a filamentous pedicel and accompanied by an appendage at its base. Entomophilous. This genus has been formed to receive the single species (*A. entomophila*, Pk.) here described. Its name is suggested by the appendicular organ at the base of the perithecium and supported with it by the common pedicel.

SEPTORIA MIMULI, E. & K.

At the request of Dr. Winter, a translation is here given of a note recently received from him in reference to *Septoria Mimuli*, Winter (see p. 122).

"Not till recently did I observe that a *Septoria Mimuli*, Ellis & Kellerman, already exists. At the same time I was able to determine, from a specimen sent by Dr. Kellerman of his species, that *mine* is identical with *S. Mimuli*, E. & K. The latter has, however, also in *Kellerman's specimen*, spores 30—44 μ long."

RETROSPECT AND PROSPECT.

In closing the first volume of the JOURNAL OF MYCOLOGY, the managing editor wishes to express his thanks for the support given by the contributors and subscribers. The very cordial reception given the JOURNAL by the numerous scientific periodicals and the naturalists both of the United States and other countries, is gratefully appreciated, and stimulates the desire to make it still more worthy of the high rank accorded it. To this end the continued support of specialists, amateurs and beginners in science is respectfully solicited. While the leading features will continue to be the publication of Monographs of North American Fungi, new species that may be discovered, and notices of new literature, prominence will also be given, during the year 1886, to articles of a popular nature intended to guide the novice. Papers outlining the modes of study of different groups and of preparing specimens, etc., will be given. Also a series of sketches of noted mycologists, with a carefully prepared list of their publications will, it is hoped, prove extremely valuable and interesting to beginners, even if not to amateurs and specialists. These will be furnished mainly by Prof. Dudley, of Cornell University, which is a guarantee of their meritorious character. This "new departure" will doubtless be welcomed by the numerous students of mycology, especially the less advanced, among whom a wider circulation of the JOURNAL is earnestly desired.

W. A. K.

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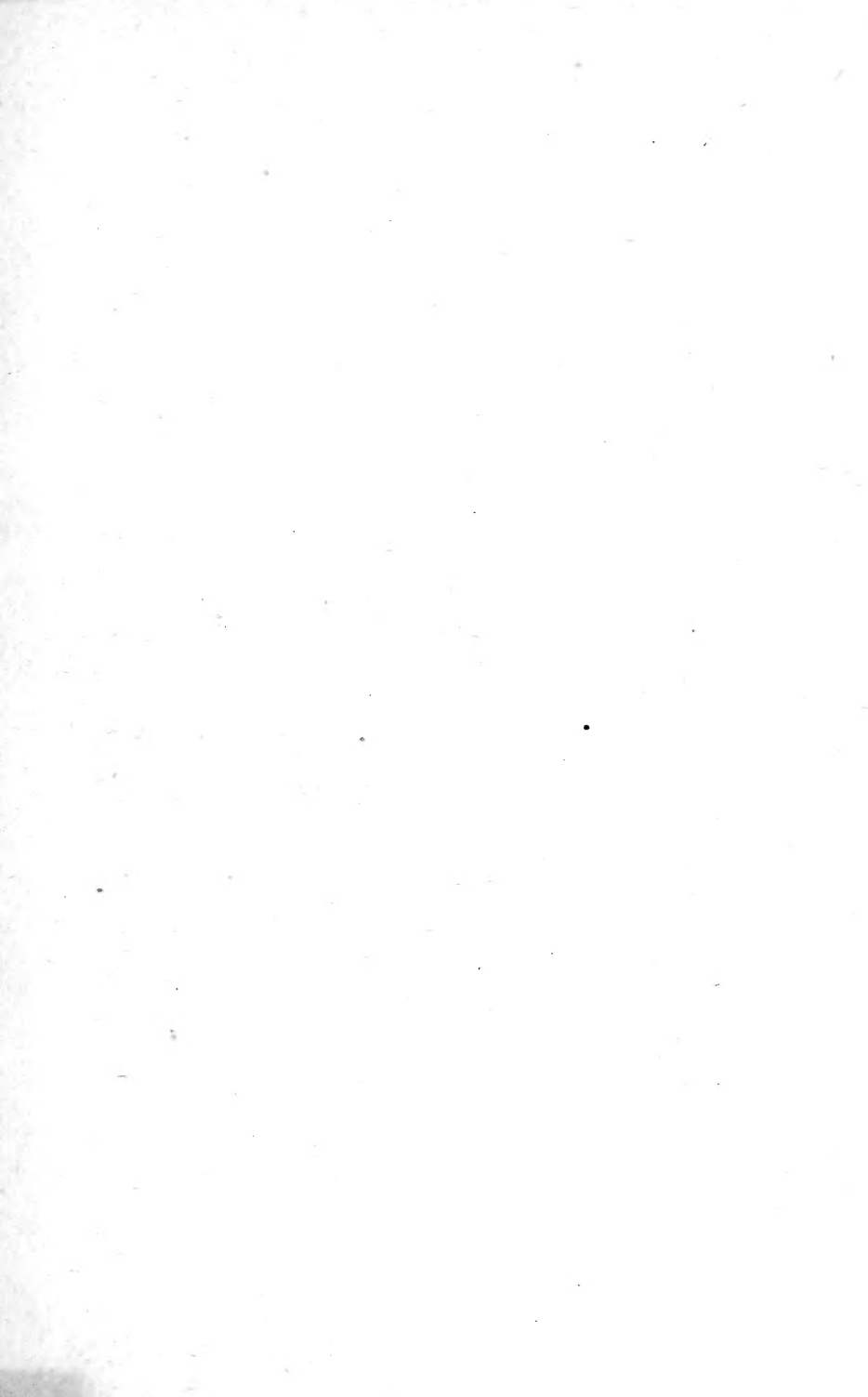
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